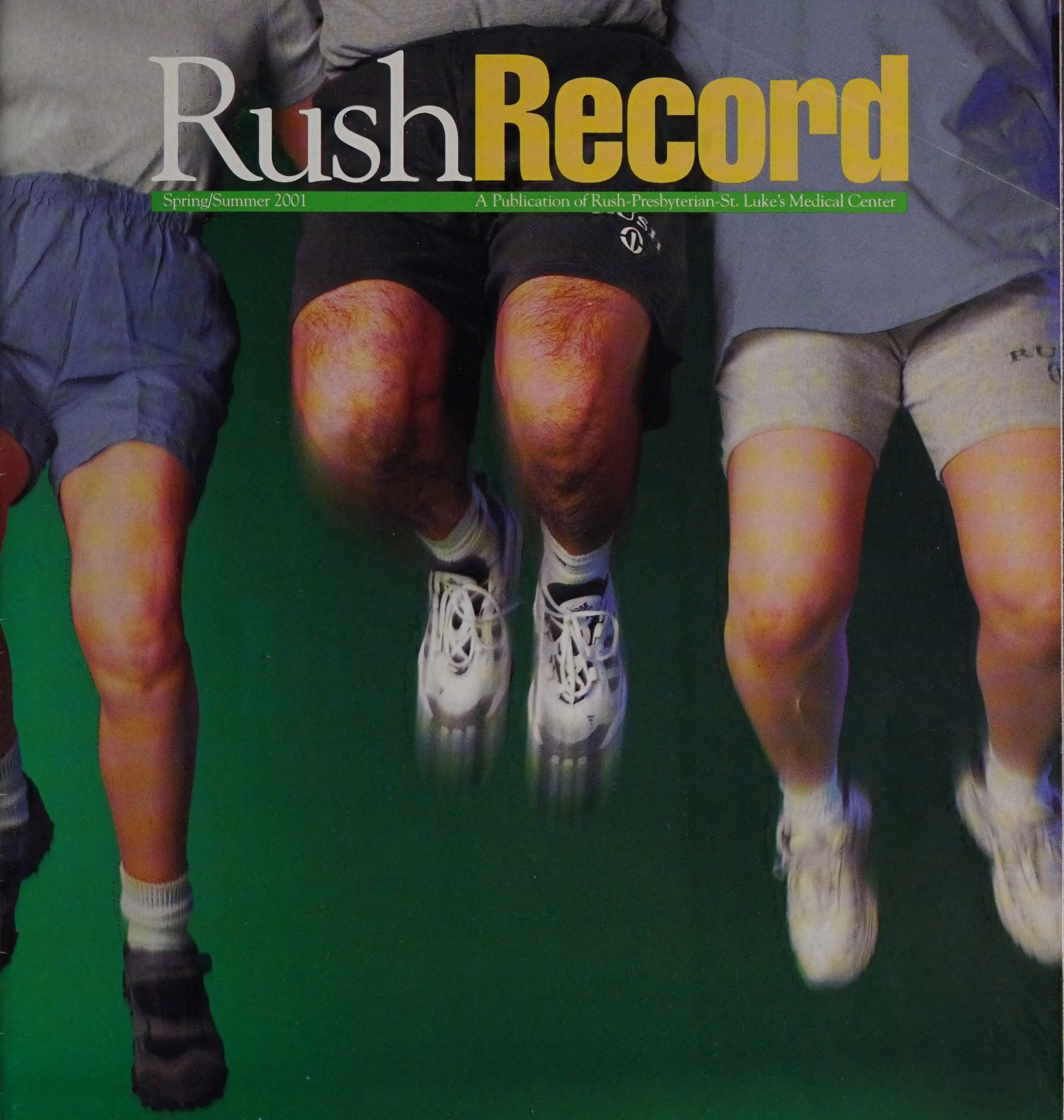
Rush Record

Spring/Summer 2001 A Publication of Rush-Presbyterian-St. Luke's Medical Center



Building Better Knees

Physicians and scientists work toward prolonging the lifetime of knee replacements.

Lighting the Way • Progress in Parkinson's Disease • Kid-Sized Medicine • Through a Patient's Eyes • A Healthier Rush

RushRecord
Spring/Summer 2001

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RushRecord is a publication of Rush-Presbyterian-St. Luke's Medical Center, produced by the Office of Philanthropy and Communication.

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A Member of the Rush System for Health

RUSH

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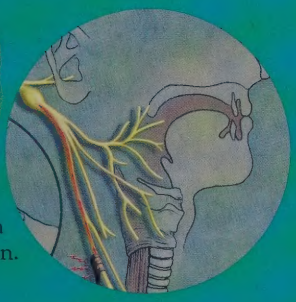

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The Caring Side of Medicine

A Rush Medical Student Reaches Out to a Community

Last year, third-year Rush medical student Shira Shavit took a journey that she will remember for the rest of her life. As part of an independent study program through Rush Medical College, she headed to a clinic in Guatemala where she spent seven months caring for the villagers and teaching local volunteers about providing basic health care services. Inspired by her experiences treating Central and South American immigrants at Cook County Hospital — which partners with Rush to give students valuable hands-on experience — Shavit went to Guatemala seeking a deeper understanding of the country's culture and how it affects the delivery of health care. What she learned there was invaluable. "Medicine is so culturally based — from how people view their illness to how they accept treatment. My experiences in Guatemala taught me lessons I could never have learned from a book; they showed me ways to recognize and overcome cultural barriers so that I can deliver the best care possible," Shavit says. • Shavit shared one such experience in an essay she wrote to accompany her submission to the Association of American Medical Colleges' annual photography contest, in which applicants were asked to capture "The Caring Side of Medicine: Reaching Out to Communities." The following is Shavit's essay. Her grand prize-winning photo appears on page 3.

by Shira Shavit

"What's the boy's name?" the impatient hospital clerk inquired again. I intentionally hesitated. In the Q'eqchi Mayan culture children are not named until three to six months of age since they often do not live longer.

After my third year of medical school, I spent seven months working at a small clinic in the Guatemalan rainforest. I went to Guatemala to help train indigenous health promoters to recognize and treat common illnesses. Not only did I learn more medicine, everything from vaccinations to deliveries, I also learned many ways the Q'eqchi deal with their extreme poverty. I saw poverty, which was greater than anything I had witnessed during my many years of experience with underserved people in Chicago.

I had not come to the hospital in Puerto Barrios that day merely to check on the boy, previously admitted for pneumonia. I had made the journey from our clinic one hour upriver to deliver a bundle ... a bundle that had arrived at the clinic that morning ... a bundle that was a small shriveled heap under a sheet on the examining table ... a bundle that couldn't possibly be what its bearer claimed it to be.

"A one-year-old?" I had asked incredulously. I approached that crumpled sheet and slowly lifted it from the face of the tiny girl. Glaring at me were two empty eyes, black and dull like the comal (griddle). Her mottled skin hung loosely, like a huipil (traditional blouse), from her emaciated arms. I sighed and looked at Marcos, the new health promoter working with me. His face was like a mirror reflecting the intense conflicting feelings of rage and heartbreak I had at that moment.

Outside the room, I dealt with these feelings by focusing on my responsibility to help train the new promoters. Rather than tell Marcos how to handle the case, I motivated him to use his fund of knowledge to formulate possible treatment options. I had learned in the alternative curriculum at Rush that good problem-solving skills are fundamental. Now I found myself relying on these same skills, especially when I was often the only one with formal medical training. It was an incredible exchange; I taught the promoters about thinking medically, and they in turn taught me about Mayan culture, life and their concept of disease. We all learned the most, of course, from the patients themselves.

Shira Shavit, a Rush Medical College student, spent seven months taking care of sick adults and children in Guatemala.

Photography by Shira Shavit

This award-winning photo shows a father taking his gravely ill 3-year-old child to a specialist in Guatemala City.

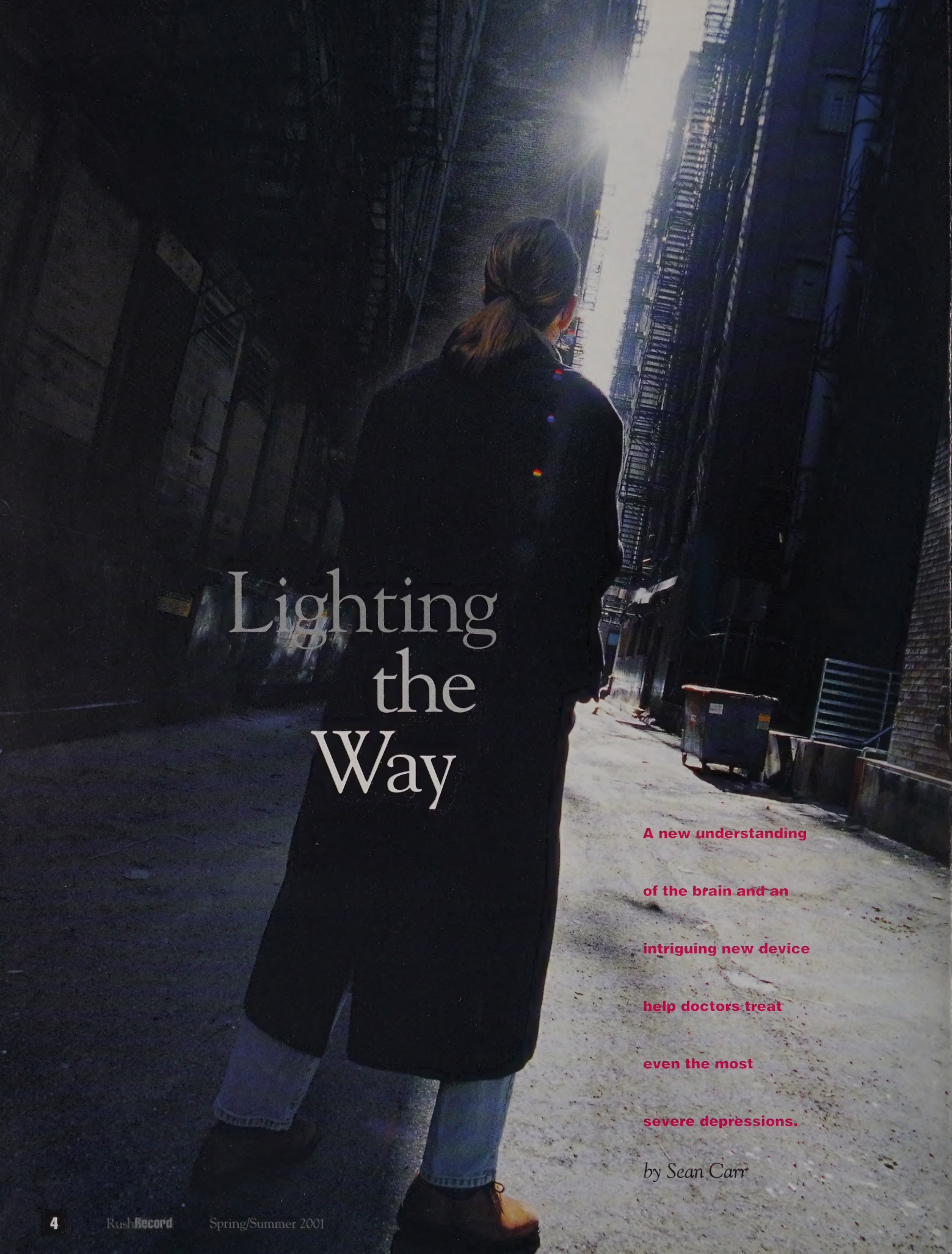
Marcos and I then escorted tiny Letty and her parents to the local hospital, as our small clinic lacked the necessary resources. During the boat ride, I watched Letty's mother rock her limp daughter in her arms, echoing the rhythm of the ocean's waves against the boat. I took a minute to imagine myself in the mother's position, a practice I like to do with my patients. The hospital would be a scary place where the faces weren't Q'eqchi, where the staff mistook the blank looks of misunderstanding Spanish as ignorance, and where the nurses' hands smelled of iodine instead of masa (cornmeal). I felt relieved that Marcos and I would be there as advocates for Letty, to ensure that she would be treated appropriately and respectfully in a system that is notoriously prejudiced against indigenous people. We would act as translators as well, with Marcos speaking Q'eqchi and I speaking "Medicine" and Spanish, in order to confirm that her parents understood and accepted the treatment plan for their daughter.

Once Letty was settled in the ward, we prepared to return to our clinic. As we started to leave, Letty's mother began to cry. I put my arm gently around her and tapped her back in a manner I had seen Q'eqchi mothers do to comfort their children. Marcos and I reminded her that we would call to check on her and to monitor Letty's progress. Leaving the ward, I turned back to enlist the help of the other mothers who had children there, asking them to help Letty's mother. I knew Marcos might think the last step was unnecessary, but from my previous experience I learned to be thorough. For example, in the clinic I always explained dosing to patients, had them recite the dosing and then sent them home with drawings of the sun and moon signifying the time of day of each dose. When barriers like illiteracy, language and distance exist, I could not risk patients forgetting or misinterpreting instructions.

Heading back to the clinic, Marcos and I discussed the case. I could tell he was disappointed that we did not treat Letty in our clinic. Although patients sometimes stay with us for a few weeks, I explained that we were unequipped to handle a case that I knew would require months of hospitalization. I pointed out to Marcos that prevention of illness, such as Letty's malnutrition, is equally as important as diagnosis and treatment. I explained that as the rain, sun and earth influenced the milpa (corn crop), medical, social and political factors influence health. These issues are intertwined, and they all need to be addressed and understood to prevent illness.

After discussing several options, we decided to plan a charla (talk) to educate mothers in the villages about the signs and symptoms of malnutrition, in hopes that they would bring their children to the clinic earlier. We also planned to generate a discussion about the mothers' feelings of shame that too often become barriers to seeking treatment.

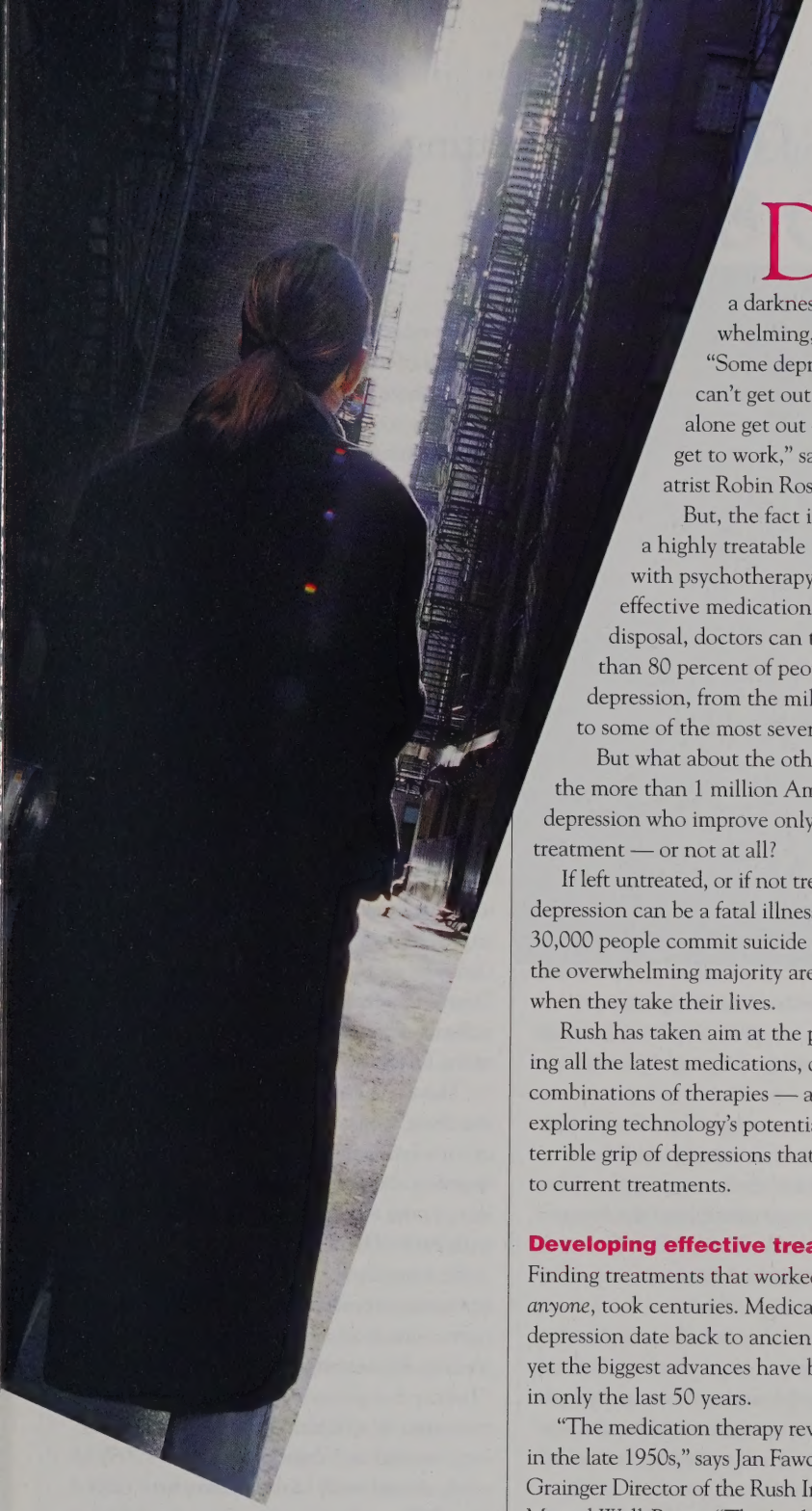
As the boat sped down the narrow river that snaked through the jungle-covered gorge, I let the passing wind carry my sadness for Letty and her family out to the ocean. Rounding a curve, I watched as the river opened into the gulf, and I looked forward to what lay ahead of me at the clinic and beyond. ■



Lighting the Way

A new understanding of the brain and an intriguing new device help doctors treat even the most severe depressions.

by Sean Carr



While there are 19 million Americans with depression today, experts say that 80 percent of depressions are treatable.

Depression traps its victims in a darkness that is overwhelming, paralyzing. "Some depressed people can't get out of bed, let alone get out of the house or get to work," says Rush psychiatrist Robin Rosenblate, MD.

But, the fact is, depression is a highly treatable illness. Today, with psychotherapy and several effective medications at their disposal, doctors can treat more than 80 percent of people with depression, from the mildest forms to some of the most severe cases.

But what about the other 20 percent, the more than 1 million Americans with depression who improve only slightly with treatment — or not at all?

If left untreated, or if not treated effectively, depression can be a fatal illness. An estimated 30,000 people commit suicide each year, and the overwhelming majority are depressed when they take their lives.

Rush has taken aim at the problem, studying all the latest medications, developing new combinations of therapies — and even exploring technology's potential to break the terrible grip of depressions that don't respond to current treatments.

Developing effective treatments

Finding treatments that worked at all, for *anyone*, took centuries. Medical "cures" for depression date back to ancient Greece, yet the biggest advances have been made in only the last 50 years.

"The medication therapy revolution came in the late 1950s," says Jan Fawcett, MD, the Grainger Director of the Rush Institute for Mental Well-Being. "That's when doctors began testing the first effective antidepressants, after two separate but fortuitous accidents. One set of researchers was testing out a tuberculosis medication. Another group was studying a drug for schizophrenia. Neither treatment worked as intended, but in both trials the doctors noticed something interesting: their patients' moods improved. Further refined, these medications became the first examples of two of the main classes of antidepressants: the tricyclics (TCAs) and the monoamine oxidase inhibitors (MAOIs). In the late 1980s, these were joined by the selective serotonin reuptake inhibitors (SSRIs), now prescribed under such familiar names as Prozac and Zoloft. While the biochemical operations of these medications differ, they all work toward the same goal: increasing the amount of one or more mood-regulating chemicals — the neurotransmitters dopamine, norepinephrine and serotonin — active in the brain.

Tweaking the controls

"SSRIs are usually our first line of treatment because they're the easiest to tolerate," says Rosenblate. "Then, going up the stepladder of medications, we try the TCAs, and then the MAOIs."

Sometimes drugs work alone. Sometimes they work in combination. Sometimes the right mix is maddeningly elusive.

"In the diagnostic manuals, every depression looks pretty much the same," says Fawcett. "But in reality, the symptom patterns and severity are very different from individual to individual. We're constantly developing new combinations so that we can address all the variants we see in people — particularly those who aren't responding to traditional therapies."

And drugs aren't always a solution in and of themselves, which has led doctors to combine

Photography by Andrew Campbell

"Nowadays, people tend to look at treatment options as one or the other — drugs or psychotherapy — when really it's often both," says Jan Fawcett, MD, director of the Rush Institute for Mental Well-Being.

"We want to see people not just getting better — we want to see them well."

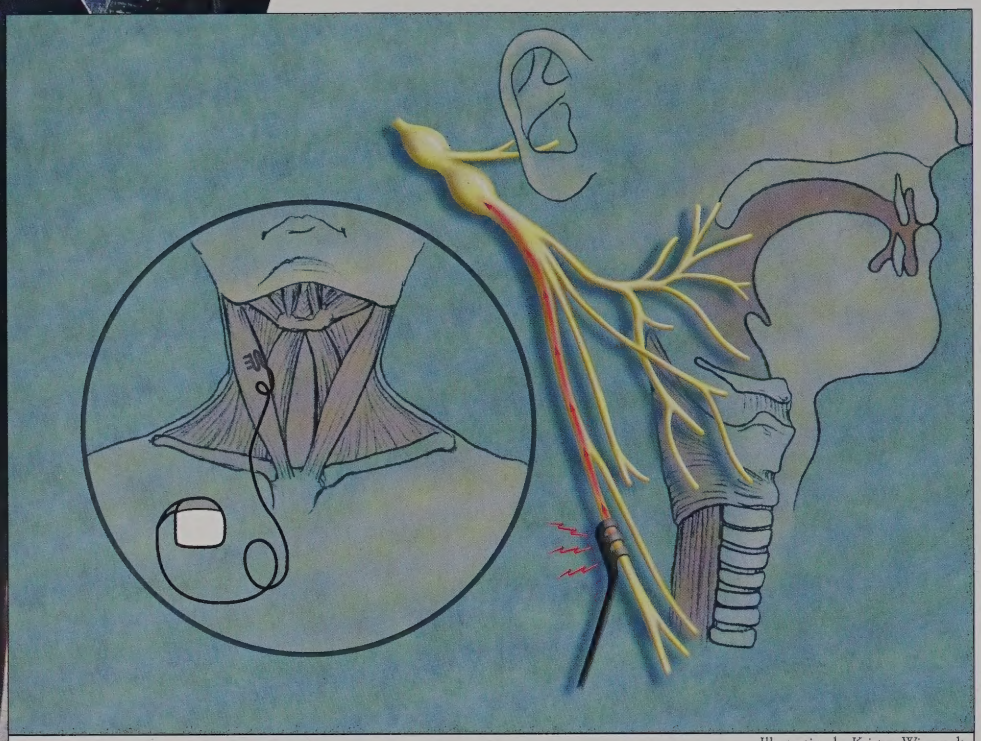


Illustration by Kristen Wienandt

Implanted in the chest like a pacemaker, the vagus nerve stimulator transmits electrical impulses up through the neck to parts of the brain associated with mood. In early trials, the device improved depressive symptoms in 40 percent of participants, with 25 percent of that group showing no signs of depression.

medication with psychotherapy. One of the most effective of the current psychotherapies goes by the name of cognitive behavior therapy, which focuses on how thought influences mood. This form of therapy works to replace patients' generalized negative thoughts — "I can't do *anything* right" — with more reasonable, specific responses: "I *can* make *this* phone call." Combining cognitive therapy with medication, researchers are making some surprising discoveries.

A new understanding of the brain

"We now know that learning actually changes the brain, chemically and in its structure," says Fawcett. "The growth of brain cells, and the way they operate, changes in relation to the information, whether positive or negative, that is coming in. Cognitive therapy, which teaches people to think differently, and thus act and respond differently, can have a chemical effect — just like medication."

Drug therapy, in turn, can do more than lift mood. With effective medication, a depressed patient can start to function again and tackle once unthinkable tasks like picking up the phone, starting — and completing — new projects and socializing. And these successes alone have their own positive effect on the chemistry and structure of the brain, independent of the medication that first made them possible. As with cognitive therapy, the patient learns "I can do this."

Fawcett believes this flexible understanding of the brain will help change certain conceptions about treatment. "Nowadays," he says, "people tend to look at it as one or the other — drugs or psychotherapy — when really it's often both."

New tools

But sometimes no combination seems to work. This complete unresponsiveness to treatment is the definition of intractable depression. In the 1930s, 1940s and 1950s, when every severe depression fit that description, the only recourse was electroconvulsive therapy (ECT), which then went by the more forbidding name of shock treatment. Still in use today, ECT has evolved over the last several decades and shed its torture chamber reputation.

"ECT is done in a very controlled, operating room environment with anesthetics and muscle relaxants," Rosenblate says. "It's a very safe and effective treatment."

But there's always room for improvement, and Rush is currently testing a new procedure called transcranial magnetic stimulation, which is similar to ECT but nonconvulsive. Treatment involves passing a magnetic coil over part of the patient's head, delivering some 1,000 magnetic pulses to the front left side of the brain. It is hoped that transcranial magnetic stimulation, which does not require sedation, will prove to be just as effective as ECT, with fewer side effects.

Another device under study at Rush is the vagus nerve stimulator, originally designed — and FDA approved — to control epileptic seizures.

"Researchers testing the vagus nerve stimulator for epilepsy found that, in addition to controlling seizures, the patients' moods improved, too," says John Zajecka, MD, clinical director of the Woman's Board Depression Treatment & Research Center at Rush, echoing the serendipitous discovery of the first anti-depressant medications.

The vagus nerve stimulator is implanted in the chest, much like a pacemaker, but instead of stimulating the heart it transmits electrical impulses, via a lead wire running beneath the skin, to the vagus nerve, which communicates with parts of the brain associated with mood.

In a small pilot study of its effectiveness in treating intractable depression, the vagus nerve stimulator improved depressive symptoms in 40 percent of the participants. "Twenty-five percent of them went on to full remission. In this kind of population, that is very impressive," Zajecka says.

A second study of the device, with more than 200 people taking part, was launched last fall. For many of these people, any relief from the depression that has stolen their lives from them would be a miracle. Complete remission would be like a second birth.

But that, says Fawcett, should be the measure of any treatment for depression. "A lot of people, even with the treatments that we have, are only getting better. We're impatient with this," he says. "We want to see people not just getting better — we want to see them well." ■

Too many Drugs or too many Diagnoses?

Interview by Jill Waite

Attention deficit/hyperactivity disorder may affect as many as one million children in the United States. But are doctors, teachers and parents rushing to judgement when it comes to diagnosing the condition? A Rush expert discusses AD/HD and the controversies that surround it.

Many see the drug Ritalin and its new competitor Concerta as quick fixes — overprescribed drugs for unruly kids who teachers and parents can't control. Some even wonder if the illness it most commonly treats, now known as attention deficit/hyperactivity disorder or AD/HD, is real or just the product of a diagnosis-happy society. And there are others still who, although they admit the problem exists, think it will pass with time or is better treated nonchemically.

RushRecord editor Jill Waite recently sat down with AD/HD expert Meryl Lipton, MD, PhD, formerly a special education teacher and currently a pediatric neurologist as well as executive director of the Rush Neurobehavioral Center and an associate professor at Rush, to discuss her views on AD/HD and its diagnosis and treatment.

"I think the problem with AD/HD lies more in its diagnosis than in the drugs that treat it. Many kids are diagnosed with AD/HD who don't actually have it, and most are prescribed Ritalin or Concerta — a psychostimulant similar to Ritalin that requires fewer doses — when the problem is something else, such as anxiety or depression.

There are children, though, who have AD/HD but never get diagnosed. Girls with AD/HD, for example, tend to be less disruptive in the classroom than boys, so they are often missed. Then there are children from environments where there's little awareness of AD/HD.

Unfortunately, there's no simple test to identify AD/HD accurately even though an estimated 3 to 5 percent of school-age kids have it. And without proper identification and treatment, AD/HD can lead to serious problems, including dropping out of school, depression, poor self-esteem and failed relationships.

Part of the problem with diagnosis is uncertainty and confusion among parents, teachers and even doctors regarding the condition itself — a condition that has gone by many names, including early brain dysfunction, hyperkinesis and, more recently, attention deficit disorder. And while hyperactivity is the symptom most people associate with AD/HD, inappropriate impulsivity and attention problems are key indicators that there is a problem.

But the most significant issue in terms of diagnosis is the assessment leading to diagnosis. Often this is done in a superficial or incomplete way, which leads to misdiagnosis. Children with AD/HD often have other associated conditions such as learning disabilities, mood disorders, tics, etc. To diagnose AD/HD correctly, there should be a comprehensive evaluation. This means gathering thorough histories from the parents, teachers and the child; clinically assessing the child's academic, social and emotional functioning; and performing a thorough medical exam to rule out other problems.

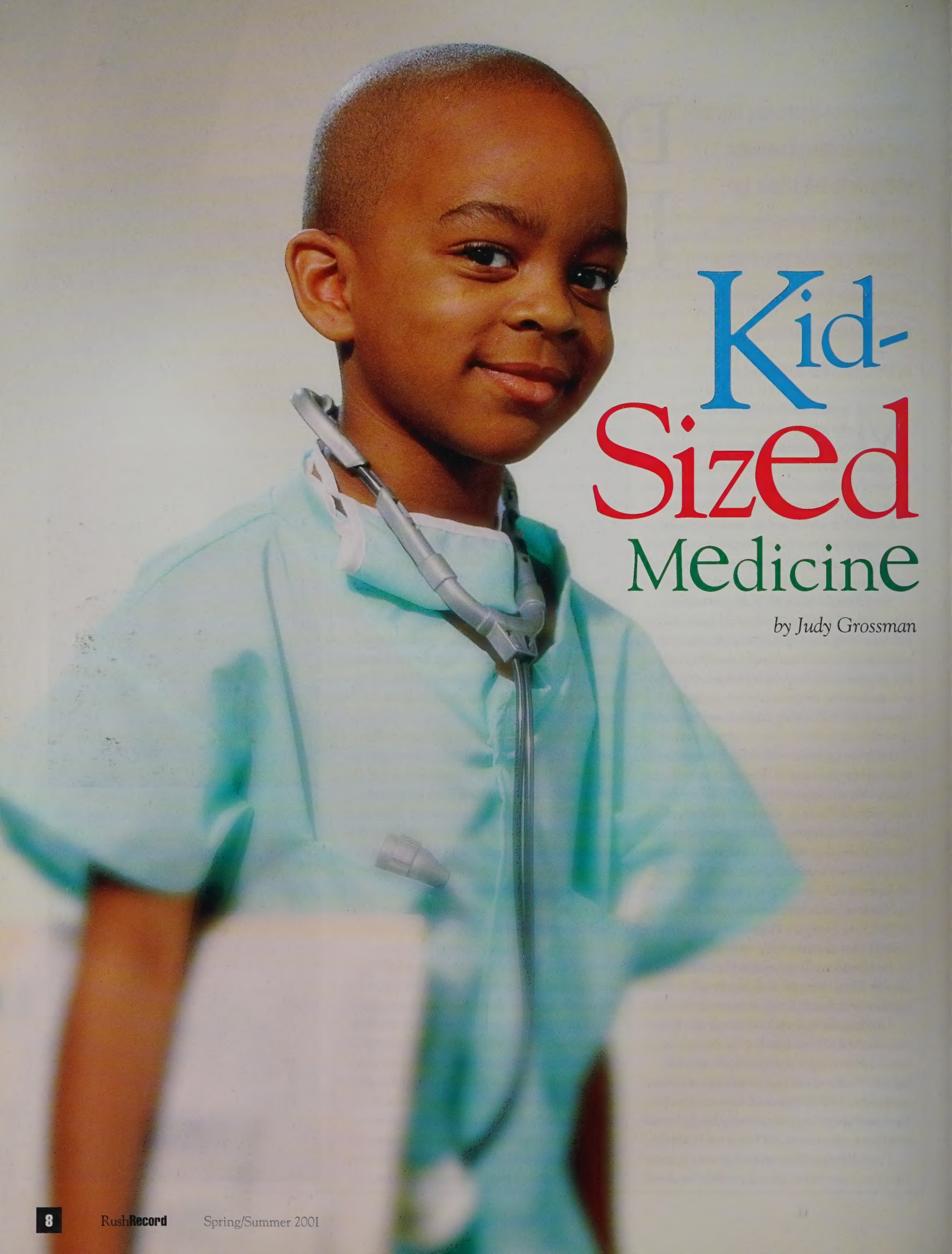
But current financial pressures on health care often prevent all of that; doctors may have only 10 or 15 minutes to perform an exam. Therefore, many write prescriptions before they have all the information they need. Even worse, the child may not have the proper follow-up. In my mind, that leads to a lot of irresponsibility in terms of the message the parents and the school get about the condition and the importance of taking medication properly.

When a thorough assessment has been done, though, and the diagnosis is AD/HD, certain medication should be part of a complete management program. Psychostimulants like Ritalin and Concerta have been shown to increase attention and decrease impulsivity, hyperactivity and aggression in 70 to 80 percent of children with AD/HD. But there are other important components to treatment. Children with AD/HD must work with their parents and teachers — and in some cases, specialists — to learn new ways to follow rules, focus and control inappropriate behavior.

The bottom line is that there's no simple way of looking at AD/HD — from how it's diagnosed to how it's treated. If you look at 100 people with AD/HD, there may be 100 different patterns of behavior. That's why individualized intervention is so important." ■

Meryl Lipton, MD, PhD

Photography by Andrew Campbell



Kid-Sized Medicine

by Judy Grossman

"Kids don't vote or pay taxes, so they need somebody to be their health care advocate."

In the children's story "Goldilocks and the Three Bears," a lost little girl stumbles upon the bears' cabin while they are away and, finding it unlocked, goes inside. Hungry and tired, she samples three different bowls of porridge, three chairs and three beds before finally finding the ones that are "just right" for her.

Finding a fit that's just right is important — from the right job to the right life partner. But it's particularly important when it comes to health care, and especially health care for children.

Although the concept that a child is physiologically distinct from an adult dates back to AD 910 and the first medical institution solely for children was established in 1769, it wasn't until the 1850s that child-centered medicine really took off. Most attribute this to the work of Abraham Jacobi, MD, known to many as the "father of modern pediatrics." During a time when children were subjected to hard labor in factories and squalid living conditions, Jacobi was a leading advocate for children's health and well being and was the first in the United States to push for a child health system.

By the early 20th century, the specialty of pediatrics had taken root. And as the years progressed, subspecialties, such as pediatric oncology and pediatric cardiology, flourished. Because, as Jacobi had noted, children are not just small adults.

Kids are, in fact, quite different — from their nutritional needs to their growing bones to how they express pain and fear. And let's face it, children get themselves into fixes that adults would never find themselves in. When was the last time a 42-year-old woman came into the emergency room because she accidentally swallowed a penny or got a bead stuck in her ear?

Today, there is no disputing that children should have doctors of their very own. "As pediatric specialists, we believe kids are better served by caregivers who focus their energy and skills on kids' needs," says Rush pediatric surgeon Kathryn D. Bass, MD. "Kids don't vote or pay taxes, so they need somebody to be their health care advocate — to say that yes, we should invest in them because they are our future."

Putting kids first

For most children, a general pediatrician is all they need. As the primary caregivers for children of all ages, pediatricians chart growth and development and address both acute and chronic medical problems. And what they find and how they approach problems is unique from what primary care physicians see in adults.

"For example, we see a lot of kids who have asthma, particularly in the inner city," says Beth Volin, MD, director of primary care pediatrics at Rush. "We deal not only with medications, but also such issues as whether a child with asthma can participate in gym class and how to get kids to take their meds at school."

Fortunately, children are mostly healthy and very resilient. That's why pediatricians focus much of their time and energy on prevention — making sure kids get their immunizations to protect against diseases — and education.

"We have a whole process called 'anticipatory guidance' that involves educating families about the changes they can expect in their children over time, from sleeping and

Photography by Andrew Campbell

Within the last 20 years, major medical centers have made a concerted effort to employ pediatric emergency specialists.

feeding, to school and learning issues, to sexual maturity," Volin says. "These are very different issues than you see in adult medicine."

Taking the anxiety out of emergencies

A visit to the pediatrician can be scary for a child, but it is often made better with a lollipop or a Pokémon sticker. Few experiences, though, are as terrifying for children and their parents as a trip to the emergency room. But when a child falls off a bike and breaks an arm or has a high fever or cries for hours but lacks the language skills to say why, the emergency room is the place to go.

In the past, when children went to the ER, they might have been seen by a family practitioner, an intern, an ER doctor or a pediatrician. Within the last 20 years, however, major medical centers have made a concerted effort to employ pediatric emergency specialists.

"When you started to talk about major traumas and serious medical problems, it became apparent that specialized training and services in the emergency department would really benefit children and families," says Jane E. Kramer, MD, director of pediatric emergency services at Rush.

When treating children in the emergency room, there are special issues to consider, such as medication dosages. "You can't give the same dose of medication to every child, the way you do with adults," says Kramer. "You have to go on a weight basis."

And the equipment used to treat kids in the ER — including blood pressure cuffs, IV catheters and needles — has to come in a whole range of sizes to accommodate different-sized kids, from the tiniest infants to six-foot-tall teenagers.

Photography by Andrew Campbell

Rush pediatric surgeon Kathryn D. Bass, MD, visits a tiny patient, Juan Antonio Venegas, in the special care nursery.

Photography by Andrew Campbell

As with many surgical instruments, these videoscopic telescopes — used for laparoscopic procedures — come in a range of sizes to fit adults, school-aged kids and infants.

But one of the toughest things pediatric emergency staff must deal with is the high level of emotion that surrounds a child's visit to the ER. In an unfamiliar setting full of strangers, it's not surprising that children cry or scream. And considering the circumstances, it's understandable that some parents panic or feel confused. "Anxiety is all around," Kramer says. "People who work in our setting have to get used to that and be able to keep things on an even keel."

With all of the challenges involved in treating kids in the ER — including trying to explain complex medical information to young kids — Kramer says it helps to have a full range of pediatric subspecialists under the same roof.

"That's why being at a place with a children's hospital such as Rush is such a luxury," she says. "It's not just physicians and nurses — we have pediatric pharmacists and radiologists and Child Life specialists (*see box on p.11*) who deal with children's issues all day, every day. It's very reassuring."

Special problems, special surgical solutions

It's especially reassuring for emergency room pediatricians and other pediatric specialists to have pediatric surgeons available when an infant or child has a problem that requires surgery — from birth defects to traumatic injuries to chronic diseases to potentially deadly conditions such as appendicitis.

Like its adult counterpart, pediatric surgery is highly specialized. General surgeons, such as Bass, are responsible for procedures involving the lungs and the extremities, and tumors and cancers in the chest and abdominal areas. For other specific areas, such as the heart, brain, bones and eyes, subspecialists are brought in.

Operating on kids, and particularly infants, requires special care and skill. Because kids have smaller blood vessels and body cavities, adult-sized surgical equipment — including scalpels, clamps, laparoscopic instruments and catheters — had to be downsized. "It's a huge investment," Bass says, "and not just financially. It takes time to train your surgical team to perform the procedures using the technology."

That investment pays off when children's lives are saved or made better. That was certainly true for twins Courtney and Calista Cooley. Because they were born three months prematurely, they had many serious complications, including some that required surgery. Bass operated on both girls to repair congenital hernias, and a pediatric heart surgeon fixed Calista's heart defect. Without these procedures, the twins might not have survived.

Kids also have a different set of surgical risks and potential complications than adults. They aren't able to tolerate blood loss as well, they are less demonstrative of their problems and they have a different set of warning signs. "Kids can compensate for their problems to a greater extent, but that doesn't mean they have a greater reserve," Bass says. "And when they've depleted all of their reserves, they crash. So the rate of sudden death can be greater when you don't recognize the red flags."

Pediatric surgeons are trained to deal with such issues, which lowers the risk considerably. "General surgeons who deal primarily with adults are often called on to evaluate children and their surgical problems, especially in underserved areas," Bass says. "However, small babies and kids with complex congenital defects are referred to major medical centers, because the expectation is that pediatric surgeons should take care of those kids."

The same can be said for all areas of pediatric medicine — the best people to treat kids are those with the expertise to handle their special needs. And finding health care that fits just right makes for a lot of happy endings. ■

Kathryn D. Bass, MD, discusses Juan's progress with his parents, Jose and Juana.

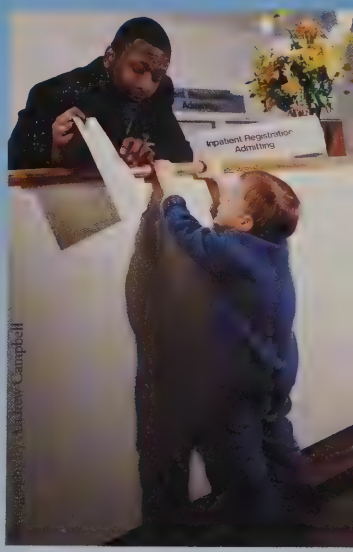
Rush Child Life Program

It has been proven that when a child's psychological, emotional and developmental needs are not met in health care settings, the child doesn't do as well physically. Rush's Child Life program was created specifically to address those needs — and to help children and their families cope with being in the hospital.

Every child who stays at Rush for more than 48 hours is assessed by a Child Life specialist. These evaluations are used to determine which therapeutic techniques — including art therapy, play therapy and music therapy — will most benefit that particular child.

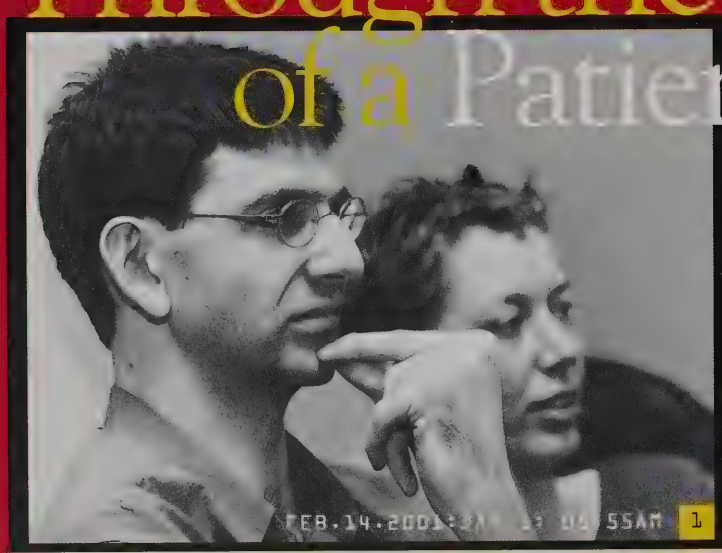
Rush's four certified specialists complement the care provided by medical staff. They give kids outlets for their emotions. They use mental imagery, distraction and relaxation exercises to help manage pain. They help prepare kids psychologically for surgical procedures. And they take the fear out of such "scary" medical equipment as needles.

"Shots are a big source of anxiety for kids," says Child Life program director Robyn Hart, MEd. "So we might have them make syringe paintings, where they use a plastic syringe — without the needle — to squirt paint onto the canvas, or we'll fill syringes with frosting and let them decorate cupcakes. This gives kids a chance to see and touch scary equipment in a nonthreatening environment."



Child Life also offers invaluable assistance for parents and siblings, from formal support groups to such simple things as sitting with a child for a few minutes so a parent can get a cup of coffee. "Parents are the most important sense of security for a child, but they're also under incredible pressure," Hart says. "We try to give them the support they need so they have the strength to be there for their child."

Through the Eyes of a Patient



Newlyweds Tony and Eve Guitart never expected that they'd spend their first Valentine's Day as a married couple in a hospital. But, having been married just five months, that's exactly where they found themselves on February 14.

Based on the recommendations of Rush cardiologist Ramesh Chhablani, MD, and cardiovascular-thoracic surgeon Marshall Goldin, MD, Tony came to the Rush Heart Institute to undergo an aortic valve replacement and replacement of the ascending aorta with coronary artery reimplantation to treat an aneurysm located near his heart. The aneurysm stemmed from a condition known as Marfan's syndrome, a congenital and sometimes life-threatening disorder of the connective tissue that affects many organs, including the skeleton, the eyes and the heart. This relatively rare disease — often characterized by spine curvature and tall stature — affects more than 200,000 people in the United States.

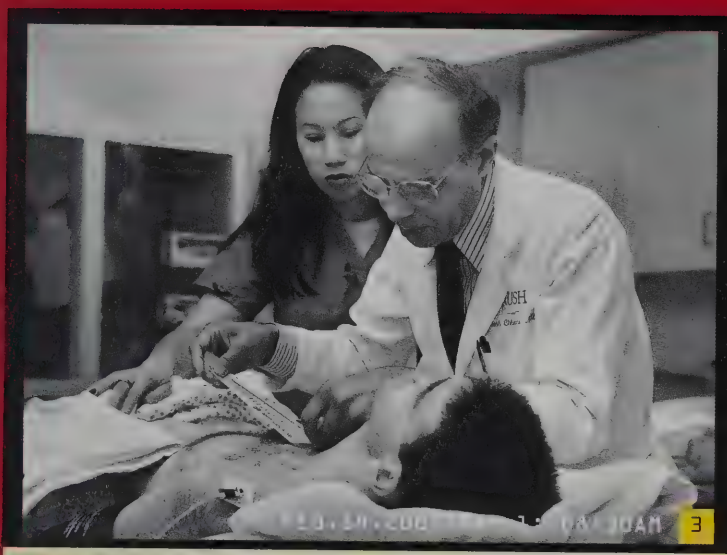
Patients — like Tony Guitart — and their families are the heart of Rush. They're why doctors and nurses keep abreast of the newest advances in medicine and what puts the spring into the step of transport staff. But visits to the hospital are often fraught with anxiety and fear as well as hope and relief. What is it like to be a patient at Rush? RushRecord *reporter* **Anne M. O'Reilly** *and photographer* **Bill Richert** *spent several days with Tony and his family to gain insight into one patient's experience.*

1 Tony and Eve arrive one day before Tony's heart surgery. Both are tired after getting up at 4:30 a.m. but they are optimistic. Tomorrow, Tony will undergo surgery for an aneurysm near his heart. **"I know I need to have it done and I know I'm in good hands,"** Tony says.

But he still worries, wondering how he might feel after the surgery. The couple distract themselves, talking about their recent wedding, their work and their need for coffee as they wait for Tony's name to be called by the admitting clerk.

2 After Tony is admitted, Gloria Strong, a patient care technician, takes Tony's blood pressure, checks his weight and takes his temperature. She does these tests to make sure that Tony is fit for surgery.

3 Tony arrives in the cardiac catheterization lab for an angiogram — a series of X-ray visualizations of the heart and blood vessels. Findings from this procedure will provide doctors valuable information about the aneurysm and help ensure that there aren't any complications during or after the surgery.



While Chhablani asks Tony about his family, Fia Torres, RN, and Chhablani prepare Tony for the angiogram. Throughout the procedure, the doctors and Torres continually tell Tony, who is awake during the procedure, what to expect — such as a slight flushed sensation after the dye in injected. After the hour-long procedure is over, cardiovascular technologist Sandra Thomas, RCPT, prints photos of the aneurysm and Chhablani shows them to Tony.

"That was a piece of cake," Tony says as he leaves the catheterization lab. Because a catheter is still in place from the angiogram, Tony must lay flat for the next six hours.

4 Eve waits for news about her husband's condition. Soon, Tony's mother, Rosa, and father, Joan, an orthopedic surgeon, will be arriving at Rush. They traveled from Spain to be with their son. Tony's brother, also named Joan, will arrive too. Early tomorrow, Tony will be taken to surgery.

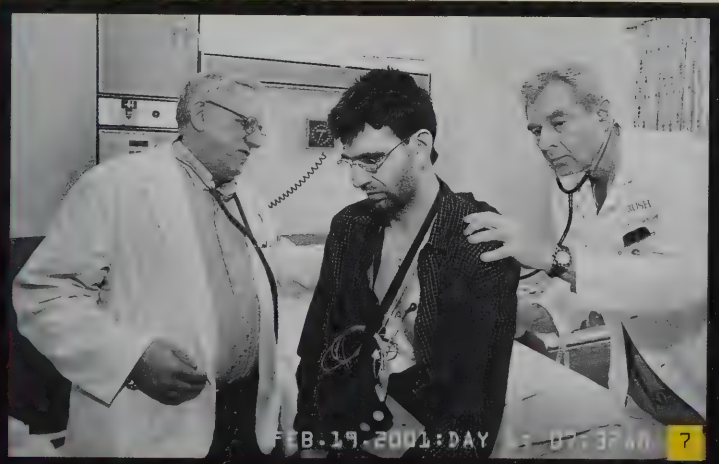
On February 15, Goldin performs the procedure and all goes well. Tony spends the afternoon and evening in surgical intensive care.

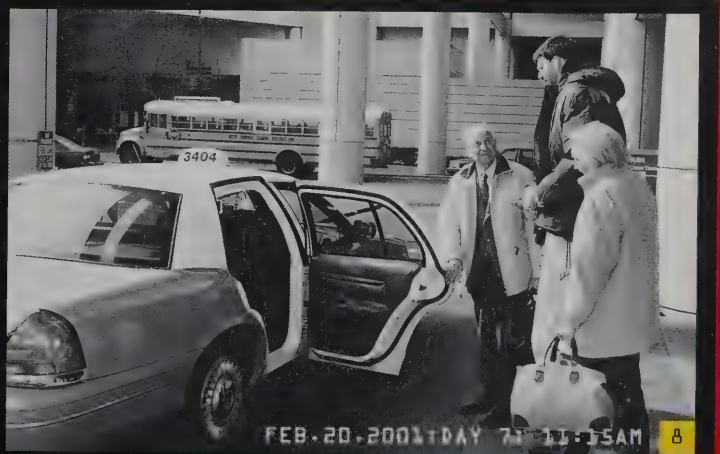
5 Happy and relieved that yesterday's 3½-hour surgery is over, Tony discusses books and movies with his brother, Jordi, and a friend, Sean Curry. Because Jordi, who also lives in Spain, is still learning English, Tony and Jordi occasionally speak in their native Catalan.

6 Eager to go home, Tony gazes at the Chicago skyline shortly after sunrise. Because of an irregular heartbeat, Tony has had to stay at the hospital longer than expected.

7 Jack Thiel, RN, and Goldin perform a thorough examination to ensure that there are no further complications. Thanks to medication, the irregular heartbeat has passed. **"I'm surprised that I could do so much so quickly,"** Tony says. **"I didn't expect to."**

8 It's time to go home. Getting into a cab with his parents, Tony leaves Rush. **"I'm very happy that everything went really well,"** he says. **"This was an important preventive step for me and it's a big relief to have this done."** And now, Tony can continue to do the things he loves to do, like visiting his family in Spain, reading and taking walks with his wife. Or maybe Tony and Eve can even celebrate Valentine's Day a little late. ■





Building Better

Whether you have given much thought to your knees recently is likely to depend on whether you are among the estimated 6 million people who — in the past year alone — have seen a physician because of knee pain. If you are one of those people, chances are there have been times when you could think of little else.

by Marie Mahoney

Photography by Andrew Campbell

Don Brown is among the 25 percent or so of patients who have undergone joint replacement surgery between the ages of 18 and 64.

The largest and strongest joint in the body, the knee can bear loads up to five times a person's weight — for a 180-pound man on his morning run, that's a whopping 900 pounds. The knee combines this brute strength with the capacity for a subtle range of motion — the freedom to twist, flex and rotate.

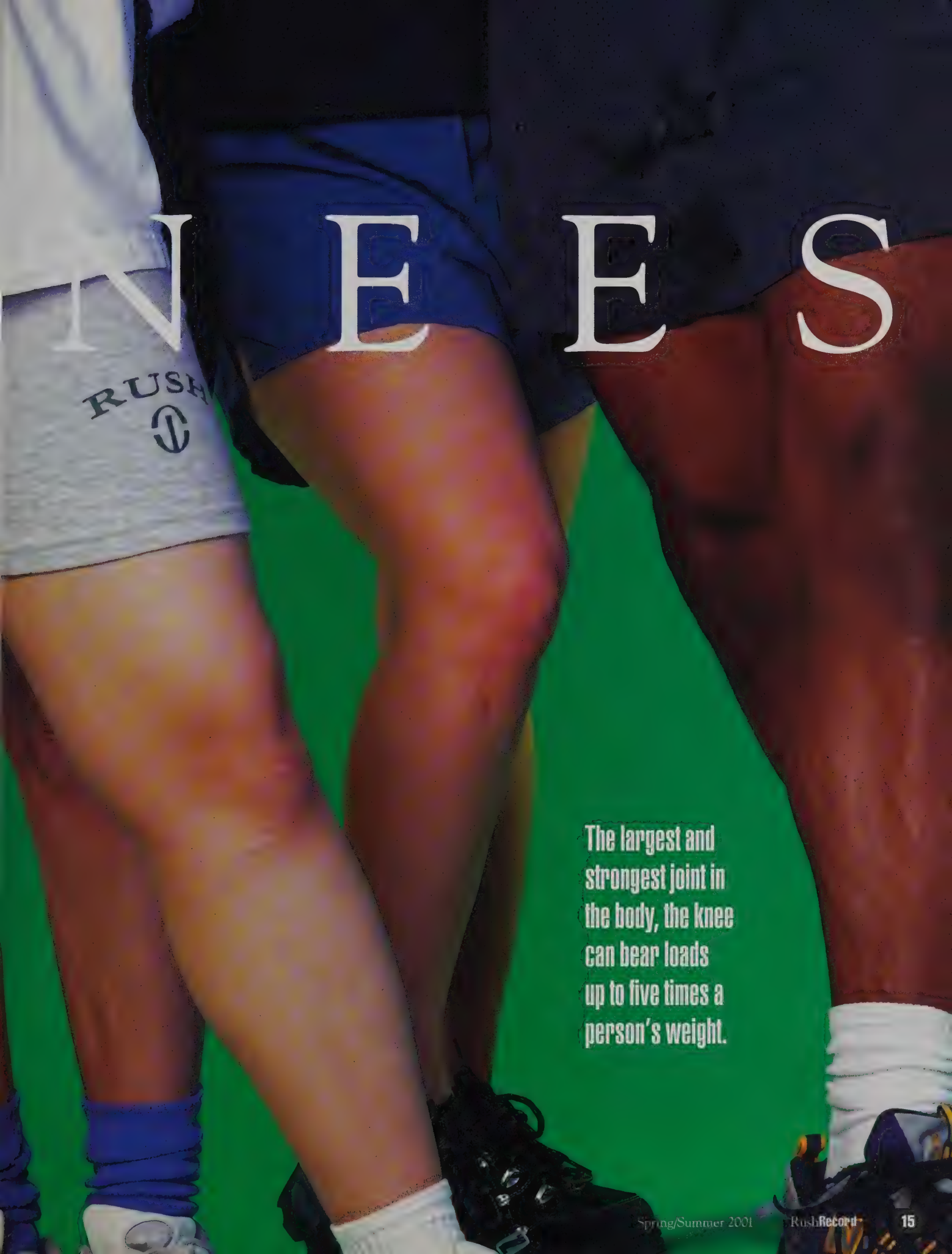
Yet, because the knee joins two bones — the thighbone and shinbone — that do not directly mate, it is also notoriously unstable and highly susceptible to injury.

For one athlete, an awkward landing after a jump can mark the beginning of years of trouble with the knee's ligaments, the sinewy tissue that connects the bones of the joint. For another, being on the receiving end of a particularly forceful tackle starts a spiral of damage to meniscal cartilage, crescent-shaped pillows of tissue that form a stabilizing platform between the bones of the knee. Sometimes the proverbial "bad knee" is the result of a lifetime of hard knocks. The knees are also vulnerable to the ravages of osteoarthritis, a degenerative disease that causes the gradual breakdown of the protective cartilage that covers the ends of bones.

Whatever the cause, disabling knee pain forces as many as 266,000 orthopedic patients each year to opt for knee replacement surgery, in which damaged portions of the knee are replaced with metal and plastic implants that mimic the structure and function of the normal joint.

Since its introduction in the 1960s, knee replacement surgery has logged an impressive track record for restoring mobility in people with advanced joint damage. Rush physicians and scientists are playing a lead role in efforts to extend the lifetime of knee replacements — through detailed studies of implant failure, through gene therapy to promote bone growth after surgery, and through laboratory research into the biology of bone and cartilage. In fact, Rush surgeons were among the first in Chicago to use new cartilage regeneration and transplantation techniques to repair early cartilage damage — potentially staving off advanced degeneration and eliminating the need for some joint replacements.

"What we're seeing with cartilage is the application of biologic techniques to the management of orthopedic problems," says Jorge O. Galante, MD, Grainger Director of the Rush Arthritis and



The largest and strongest joint in the body, the knee can bear loads up to five times a person's weight.

"These new techniques make it possible for us to regenerate and transplant cartilage before more advanced degeneration occurs."

Orthopedics Institute. "Thirty years ago, our goal was to create the perfect artificial joint, fashioned out of metal and plastic. Our research goal now is that we will one day be able to implant a joint made entirely from biologically engineered human tissues."

Setting the stage

The extent to which orthopedic researchers are within sight of that goal is due, in no small part, to developments in joint replacement surgery that Galante himself pioneered over a career spanning almost 40 years.

In the late 1960s, while on staff at the University of Illinois, Galante and his colleagues developed a cementless method of affixing knee implants that continues to provide an alternative to fixation with methyl methacrylate — a sort of super glue for joint replacements. Using a fibrous titanium mat attached to the implant to fit the shape of the joint's missing bone, Galante's method harnessed the power of the body to repair itself. The porous mat allows new bone and blood vessels to grow into the implant. This forms a biological bond between the bone and artificial replacement parts that, in some cases, is superior to bonds created by cement. Prostheses designed using this principle are industry standard today, used worldwide by surgeons who perform knee and hip replacements.

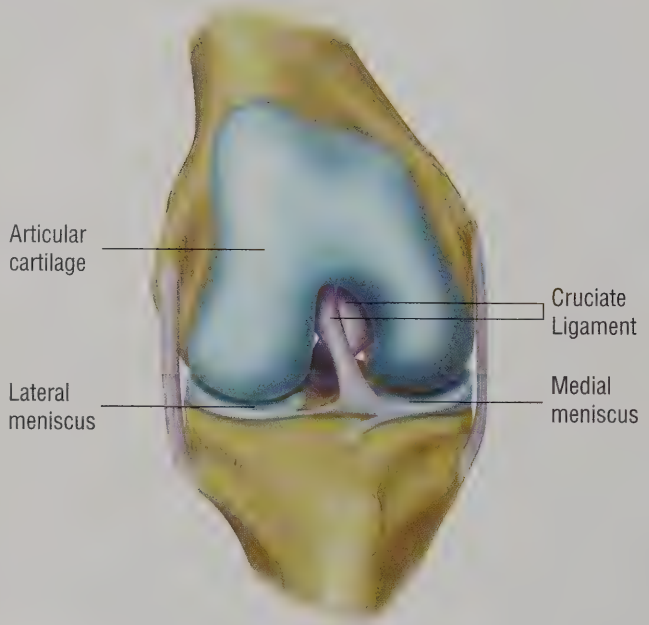


Illustration by Kristen Wienandt

The knee joint is formed by two bones — the femur, the large bone of the thigh, and the tibia, or shinbone. A third bone, the patella (not shown), is not attached to either bone, but is suspended in place by ligaments that connect the femur and tibia. Crucial to the structure and function of the knee are two forms of cartilage. Meniscal cartilage, two crescent-shaped pillows of cartilage that sit between the femur and tibia, creates a stabilizing platform for the knee. The ends of bones are covered with another form of cartilage, articular cartilage. White and shiny, with a rubbery consistency, articular cartilage absorbs shock and provides a smooth bearing surface to ensure ease of motion.

Extending the lifetime of implants

Thanks to dramatic improvements in cementless and cemented implants alike, joint replacement failure is becoming increasingly uncommon. Nevertheless, joint replacements still have a limited lifetime, says Joshua Jacobs, MD, the Crown Family Professor of Orthopedic Surgery at Rush.

"Today," Jacobs says, "about 90 percent of implants are fine after 10 or 15 years." To find out what goes wrong in the other 10 percent of cases, Jacobs is involved in several research studies investigating osteolysis — an insidious process that causes implants to loosen and can lead to massive bone loss.

"Most of the time, when joint replacements fail, it is because of a biological reaction to microscopic particles released as a result of implant wear," Jacobs says. This microscopic debris throws a wrench into the complex process of bone remodeling, in which bone formation and breakdown occur at essentially the same pace. For instance, the presence of wear particles is a call to arms for macrophages, immune system cells that remove damaged tissue or foreign invaders. Once mobilized, the macrophages secrete substances that stimulate the breakdown of bone. At the same time, wear particles also make it difficult for osteoblasts, bone cells that play a crucial role in repair, to do their job.

Jacobs and his colleagues hope that deepened understanding of osteolysis will provide data that can be used to design better implants, to refine surgical techniques and to develop pharmacological agents to modify the body's response to wear particles.

An option for younger patients

An important goal of this research is to extend the lifetime of joint replacements for people like Chicago attorney Don Brown, who is among the 25 percent or so of patients who undergo joint replacement surgery between the ages of 18 and 64.

The 53-year-old Brown underwent a total knee replacement 18 months ago. He traces his knee damage to a high school football injury. His football career — along with further skirmishes with knee pain — continued through college. After college, he maintained a full calendar of sports activities, including softball, volleyball and regular running.

About eight years ago constant pain forced him to give up running. It was then that he consulted Rush orthopedic surgeon Charles Bush-Joseph, MD.

Bush-Joseph told Brown he would eventually need a knee replacement.

"He said I'd know when the time was," Brown recalls. The time came one night a couple of summers ago, when Brown woke up to excruciating pain. Taken by ambulance to a local hospital, Brown was then transferred to Rush, where arthroscopic examination revealed the source of his pain: bleeding from the bone marrow, where bone had been entirely worn away.

Ultimately, Busch-Joseph referred Brown to a colleague, Rush surgeon Aaron Rosenberg, MD, who specializes in complex knee

Photography by Andrew Campbell

As avid joggers, orthopedic surgeons Mitchell Sheinkop, MD (left), and Brian Cole, MD (right), appreciate the importance of strong and healthy knees.

surgeries. Today, Brown can enjoy an active life — within limits. He rides a bike, speed walks every day and keeps up a brisk pace on his frequent jaunts from his downtown office to the courtroom.

Repairing and regenerating cartilage

Yet, had Brown suffered his original injury today, it is possible surgeons would have been able to repair his cartilage — delaying or perhaps preventing the degeneration that ultimately made surgery his only option.

Today's orthopedic surgeons have at their disposal new techniques for transplanting and repairing cartilage that were not available as recently as five years ago. One technique, called autologous chondrocyte implantation, has shown initial success in treating small defects in the articular cartilage that protects the ends of bones.

In this procedure, surgeons harvest cartilage tissue from the patient's own knee. The tissue is sent to a cell-culturing facility, where it serves as a "starter" to grow millions of new cartilage cells. The surgeon then implants the new cells in the damaged part of the knee, where the cells continue to multiply and integrate with surrounding cartilage.

"These patients have cartilage defects that, if unchecked, would lead to advanced arthritis and, in many cases, knee replacement," says Brian Cole, MD, director of the Rush Cartilage Restoration Center, a program of the Arthritis and Orthopedics Institute. "In the past, we would have had to tell them to wait, watch and deal with their pain symptomatically. These new techniques make it possible for us to regenerate and transplant cartilage before more advanced degeneration occurs."

Stem cells hold promise for a new source of cartilage

So far, it appears that autologous chondrocyte implantation is useful only for the repair of relatively small cartilage defects. For this reason, researchers have begun to explore the possibility of using certain stem cells to create a more plentiful supply of cartilage cells that may one day allow surgeons to repair deeper, more widespread cartilage defects.

At Rush, basic research on these stem cells — called stromal cells — is under way in the laboratory of Amarjit S. Virdi, PhD, assistant professor of anatomy at Rush. Virdi, who recently set up shop in the new Robert H. and Terri Cohn Research Building, is conducting research to understand the process by which stromal cells differentiate into bone, cartilage and other cells.

The bionic ... knee?

Ironically, the ultimate stumbling block in creating a bioengineered knee implant may lie in the limits of our understanding of gross anatomical processes, rather than cellular and molecular processes, says Dale R. Sumner, PhD, chairman of the department of anatomy and director of the section of bone biology in the department of orthopedic surgery.

"We know a lot about stimulating bone formation at the molecular level," says Sumner, who is currently investigating the use of growth factors to enhance implant fixation and bone regeneration in total knee replacement.

We know less, he says, about the intricate process through which heredity and environment interact to create a functioning joint.

"Science, for various reasons, has been focusing lately on smaller and smaller biological structures. But there's still a tremendous need to understand how tissues function at the gross level," he cautions. "It doesn't do much good to get a cell to do handstands in a culture if you can't reproduce that at the level of gross anatomy." ■

Photography by Andrew Campbell

Amarjit S. Virdi, PhD (front), talks with anatomy chairman Dale R. Sumner, PhD (back). Virdi is conducting research to understand the process by which stromal cells differentiate into bone, cartilage and other cells.

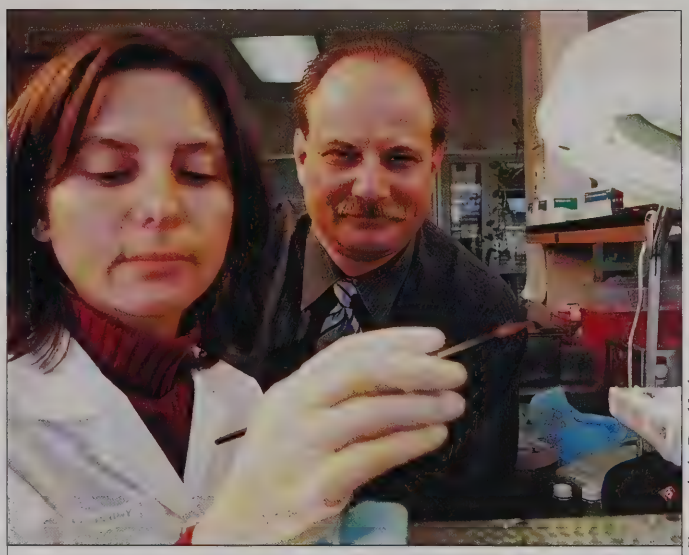
progress in Parkinson's disease

by Jill Waite

Larry Reynolds, shown here with his wife, Karen, is one of the 1 million Americans affected by Parkinson's disease.

Photography by Andrew Campbell

At 45, Larry Reynolds was the envy of most men his age. Fit and trim, he ran 15 miles three times a week, played basketball regularly and traveled the globe with his wife, Karen. But then Larry's body began to defy him.



Photography by David Joel

Jeffrey Kordower, PhD, and his colleagues were able to reverse the cellular changes caused by Parkinson's disease in animal subjects.

His feet — once quick and light — pounded heavily against the pavement as he jogged. As time went on, Larry, now 58, started to display even more troubling signs. "Like an old man, I wasn't swinging my arms when I walked," Larry says. Then, while taking a shower, Larry noticed that he couldn't even bend his toes. "That's when I knew that something was definitely wrong."

But what was wrong took months to determine.

The diagnosis, made by Rush neurologist Lois Nora, MD, surprised both Larry and Karen; it was Parkinson's disease. "I had read a lot about Parkinson's," says Karen, "but everything said that Parkinson's was a disease of older people."

But, as Michael J. Fox has shown the world, Parkinson's is not just a disease of the elderly. Of the 1 million Americans affected, almost 15 percent are diagnosed before the age of 50.

Fortunately, though, work is under way in clinics, operating rooms and research laboratories to help people — both young and old — with Parkinson's disease. Recent discoveries, some of which were made at Rush, are helping patients with Parkinson's disease and opening intriguing avenues of research and treatment for other diseases of the brain — from amyotrophic lateral sclerosis to Huntington's disease to Alzheimer's disease.

The knowns and unknowns

First described by James Parkinson in 1817, Parkinson's disease is the most common form of Parkinsonism — a group of disorders that share many of the same symptoms, such as tremors, slowness of movement, rigidity and loss of balance. Although certain types of Parkinsonism have been attributed to toxins, drugs and viruses, what is often called idiopathic Parkinson's disease has no known cause or cure.

What doctors do know about Parkinson's disease is that it is a progressive, chronic neurological condition that causes brain cells to degenerate and reduce production of an important neurotransmitter called dopamine. When the level of dopamine decreases significantly, messages from the brain get interrupted or delayed, resulting in problems controlling movements. And, although not fatal itself, the disease's symptoms — such as loss of balance — can be dangerous and significantly alter a patient's lifestyle.

For Larry, Parkinson's meant eventually leaving his job and giving up running and basketball. Traveling, especially in airplanes, has become particularly difficult. "The narrow aisles are tough for me to navigate without hurting myself," Larry says.

When Larry first came to Rush's Movement Disorders Center 13 years ago, he saw significant improvements in his initial symptoms. As the disease has progressed, though, Larry — along with his doctors and nurses — have been faced with many challenges. But with cutting-edge treatments at his disposal, Larry remains positive.

Photography by Andrew Campbell

Christopher Goetz, MD, has helped hundreds of patients with Parkinson's disease as director of Rush's Movement Disorders Center.

Forty years of Levodopa

Larry's mainstay of treatment has been the drug levodopa, which was first introduced in the mid 1960s. By entering the brain and converting to dopamine, levodopa has the power to prevent many Parkinsonism symptoms. This drug, in combination with other medications, has brought welcome relief to patients with Parkinson's disease for almost 40 years and is still a leading treatment. But with long-term use, side effects develop and limit the safe dose of levodopa. Side effects like dyskinesias — the involuntary jerks and spasms that make life difficult for Parkinson's patients like Larry — pose serious problems.

Today's clinical research

Resistance to drugs, loss of long-term responsiveness and side effects have confounded physicians for years. Resolving these issues is at the core of many current studies. Tackling the side effects of medication has been particularly tough. "Drugs are not as specific as we would like; while they stimulate the production of dopamine or the dopamine receptor proteins, they inadvertently stimulate other areas of the brain and cause dyskinesias and hallucinations," says Christopher Goetz, MD, a leading clinical researcher and director of Rush's Movement Disorders Center.

Controlling dyskinesias is the focus of a research study led by Rush neurologist and Rush Movement Disorders team member Leo Verhagen, MD. In this study, in which Larry participates, a new agent designed to control involuntary movements will be tested. And an upcoming study plans to tackle the problem of hallucinations — a less common but disturbing side effect of medication.

Photography by Andrew Campbell

Larry Reynolds first noticed symptoms of Parkinson's disease when he was just 45. He currently participates in a clinical trial designed to reduce side effects of medication.

Levodopa, in combination with other medications, has brought **welcome relief** to patients with Parkinson's for almost 40 years.

A class of drugs called COMT inhibitors, which prevents the breakdown of levodopa before it reaches the brain, is also being investigated. "The concept is that patients exposed to these drugs will do better in terms of overall function and will not develop side effects that they would get if we just increased their doses of levodopa," Goetz says.

Another approach to Parkinson's in the clinic focuses on the concept of neuroprotection. Doctors hope that by treating patients earlier, they can equip cells with a self-defense system. At Rush, an NIH study led by Goetz is now under way to see if administering levodopa — normally reserved for later stages of the disease — can alter the progression of disability in the early phases of Parkinson's disease.

Breakthroughs in the lab

These clinical studies reflect just a fraction of the research under way in Parkinson's. Much of today's exciting work is being done in the lab. Last October, Rush researcher Jeffrey Kordower, PhD, and colleagues in Lausanne, Switzerland, rocked the science community when they announced astounding results using a viral system to deliver a gene product called GDNF — a nutrient that strengthens and protects cells — to the brains of animal subjects. By injecting GDNF, Kordower's group was able to reverse the cellular changes caused by Parkinson's. "What's exciting about our treatment, as opposed to many of the others, is that we're addressing the underlying disease process. We're trying to stop the disease from progressing," Kordower says.

According to Kordower, the group's findings could offer valuable clues about treatments for other neurological conditions. "Some of the neurons in the brain that are particularly vulnerable in diseases such as ALS, Huntington's disease and Alzheimer's disease are also responsive to the nourishing effects of trophic factors," Kordower says. "And by using this delivery system, it now seems as though these trophic factors can be sent to the brain in a very nontoxic way."

Across the hall from Kordower, Paul Carvey, PhD, chairman of the department of pharmacology, is leading the way in stem cell research by successfully converting stem cells into dopamine neurons and producing dopamine-rich cultures that he hopes will eventually be an effective way to pump up dopamine production. Carvey's work may not only translate into better treatments for Parkinson's patients, it may pave the way for repairing spinal cord injuries by rejuvenating cell production in damaged or severed areas of the spinal cord.

Photography by David Joel

Rush neurosurgeon Roy Bakay, MD, is a world-renowned expert in deep brain stimulation, a procedure that helps reduce symptoms in patients with late-stage Parkinson's disease.

Surgical approaches

The operating room has also seen dramatic advances in the treatment of Parkinson's in recent years. Today's treatments are based on work done in the early 20th century, when doctors found that by selectively injuring parts of the brain they could alleviate some symptoms. But pinpointing the exact spot for injury, or lesioning, proved to be problematic, according to Rush neurosurgeon Roy Bakay, MD. "Visualization techniques of that period lacked the sophistication to lead surgeons to the right spot on a consistent basis," he says.

By the late 1950s, though, the thalamus — the coordinating center for all nerve impulses — was considered a surgeon's best bet. Thalamotomy — a procedure in which heated electrodes are used to neutralize areas of the brain believed to cause tremors — proved successful in alleviating tremors in some patients. But when levodopa arrived on the scene, surgery drifted to the background of treatment options.

The 1990s, though, saw a resurgence of interest in another surgical approach from the 1950s and 1960s called a pallidotomy, which addresses some of the more debilitating symptoms of Parkinson's disease in late-stage patients. In this procedure, lesions are made in the globus pallidus, thereby deactivating the area in the brain that causes rigidity, gait problems and slowness of movement.

A less destructive alternative for late-stage patients is deep brain stimulation. In this procedure, an electrode is placed deep within the brain to shut down overactive circuits caused by low dopamine levels, and it is controlled by the patient with a magnetic device. "A real advantage of this is that you can turn it off. If a new and better surgery comes along, you can simply inactivate it," says Bakay, a world-renowned surgeon and expert in pallidotomy and deep brain stimulation.

Leading the way for other diseases

Progress in Parkinson's is good news for Larry Reynolds. But it's also promising for thousands of others with neurological disorders. "If we crack this disease," Goetz says, "then it will serve as a model for other diseases. That's why what we're doing today in the lab, in the clinic and in the operating room is so very important." ■

A Healthier Rush:

A conversation with Rush's president and CEO

Interview by Sean Carr

The Balanced Budget Act of 1997 targeted Medicare for $45 billion in savings over a five-year period. Yet after only four years, the cuts made have achieved more than $100 billion in savings — savings that have come at a cost: Hospitals are suffering, and academic medical centers such as Rush have been hit particularly hard. These institutions rely on Medicare payments to help cover the high costs of their special missions, which include investigating new treatments, educating tomorrow's doctors and nurses and caring for the nation's uninsured. What's more, managed care has been steadily reducing what it will pay for services — and the HMOs are only getting more aggressive. RushRecord *spoke with President and CEO Leo M. Henikoff, MD, about how Rush is confronting these pressures and transforming itself for the future of health care.*

First off, was there any way to see these cuts coming?

Starting in 1994, we anticipated reductions in payments from managed care, with some reduction in Medicare. Plotting things out, we saw that we would have to cut costs significantly in operations at the Medical Center. So we set ourselves a goal: reduce expenses by $120 million per year or 20 percent and accomplish this goal in three years. By reengineering operations throughout the hospital, we made those savings, and we did it without sacrificing quality of care. Today, we have a very efficient hospital. But during the third year of the reengineering process, the Balanced Budget Act went into effect, and no one in the country had expected the kind of cuts it called for. Keep in mind, however, that the hospital has remained profitable throughout all of this.

If the hospital is still profitable, what's the problem?

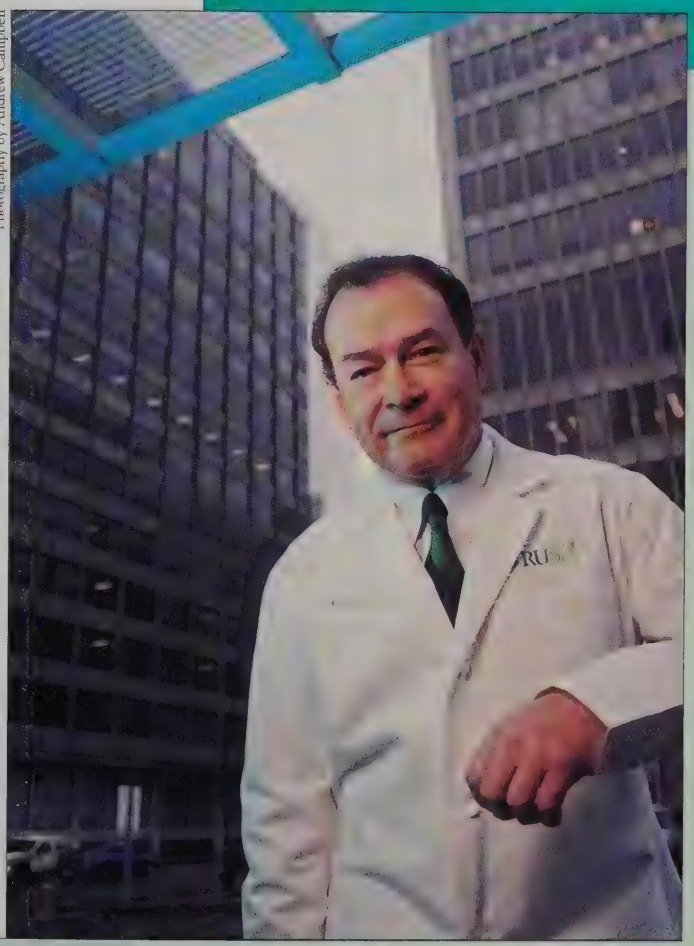
Back in 1969, when the Medical Center was created, it was decided that the hospital would be the financial engine that supported our other activities: the four colleges, research, graduate medical education and the Rush Institutes. At the time, it made sense. The hospital was making $55 million a year, while the university's annual costs were only $20 million. But over the years, external factors — smaller payments from managed care and cuts in Medicare reimbursements — have drastically reduced hospital profitability. At the same time, Rush University has grown, and now costs us some $50 million. So the question became, "Is it still viable to run a health university on the back of a hospital?"

And the answer?

Yes, but only if the university and the other nonhospital functions are reengineered as effectively as the hospital has been. That's what we've set out to do with our Three-Year Plan. By 2003 education at Rush will be self-sustaining, and further increases in hospital profitability will help support research and certain one-of-a-kind programs in the Rush Institutes. These are important programs, such as the Cancer Institute's Comprehensive Breast Center, where a patient can see three different specialists during a single visit. You simply cannot charge enough for that level of care, and that's why we will continue to support it.

Is the plan working?

It's still early, but so far the numbers are encouraging; we're ahead of plan. This first year, we're looking to reduce the Medical Center's deficit by 50 percent. In the second year, we want to reduce that by half again. Looking at our progress so far and projecting out to the end of that second year, I actually think we'll do significantly better. The third year will take us to a positive bottom line. But building up that bottom line isn't our only focus. What we haven't done in a time of financial pressure is sacrifice our future. We have continued to invest in new programs and to bring new people on board, because we know they have significant contributions to make in the years to come. ■



Photography by Andrew Campbell

School-Based Clinics Make the Grade

by Anne M. O'Reilly

At two west-side Chicago high schools, pregnancy rates have dropped drastically in recent years — by 50 percent at one school and by 75 percent at another. And at a 650-student elementary school in the same neighborhood, immunization rates are at a glowing 100 percent, up from 80 percent a few years ago. One reason may be that the Crane Technical Preparatory Common School, Orr Community Academy High School and E. Franklin Frazier Elementary School all have school-based health centers, supported by Rush.

Below: Fourth-year medical student Janiece Stewart hugs Tiniah Gant, a six-year-old student at Frazier Elementary School. Stewart says the biggest perk about working at Frazier Clinic is the kids. "I just love them," she says.

Above: Shirley Sapala, EdD, FNP, RN, a pediatric nurse practitioner at Frazier, talks with Carl Franklin, age six, about healthy habits as Frazier's assistant principal Shirley Scott looks on.

Right: Julia Muennich Cowell, PhD, RNC, FAAN (left), with the nurse practitioners at Crane and Orr — Diane Smith, MSN, CS, RN (middle), and Carol Wardlaw, MSN, CS, RN. Both schools offer on-site health services to hundreds of students. They treat everyday symptoms like runny noses and stomach aches, while also providing health education.

Photography by Andrew Campbell

Photography by Andrew Campbell

Shirley Sapala, EdD, FNP, RD, pediatric nurse practitioner at Frazier, tests Carl Franklin's breathing capacity with a peak flow meter. This is a common test for children who have asthma.

School-based health centers encourage good health behaviors and wellness in children by offering primary care, acute care, reproductive health services and health education services.

By being available to kids day in and day out, the centers help to reduce absences from school, decrease costly emergency room visits and assist children and their families in effectively managing chronic health problems, says Amy Valukas, MPH, assistant director of the Rush Community Service Initiatives Program and administrator of Frazier Clinic.

"It goes without saying, especially with adolescents, that having access to health care services is very important," says Julia Muennich Cowell, PhD, RNC, professor and chair of the department of community and mental health nursing. She is in charge of the school-based health centers at Crane and Orr. Frazier clinic is managed through the Rush Community Service Initiatives Program and the Department of Preventive Medicine.

Access to a variety of services is exactly what kids get at all of these clinics. Doctors, nurse practitioners, health educators and social workers staff the centers and care for everyday symptoms like runny noses or stomach aches, while also providing health education about topics including sexuality and reproductive health services. "If I have a headache, stomach ache or if I need somebody to talk to, I can go there," says Crane high school senior Laquisha Russell.

For many students, the clinics fill a void, says Carol Wardlaw, MSN, CS, RN, Crane's nurse practitioner. "It's obvious that many students have never really been checked out by a doctor fully before," she says. "Some will ask me, 'What do you mean I have to remove my shirt so you can listen to my chest?' They've never had complete physicals before."

The centers, especially at the high school level, also help students manage stress. "They come in with stress headaches because they're working five or six hours after school, and some have their own children at home to take care of too," says Diane Smith, MSN, CS, RN, Orr's nurse practitioner.

In only its second year, Frazier clinic is still building its services, literally. Now housed in a classroom, the clinic soon will have separate exam rooms, waiting rooms and a nursing station. Helped by a grant from the Polk Bros. Foundation, Frazier clinic also is building a plan for mental health and dental services and health education.

"In recent years, mental and dental health have been recognized as the areas where school-aged children have enormous problems that usually go untreated," says Valukas. "Virtually every child who comes into the health center has a dental problem. The most common mental health issues are attention deficit disorder and hyperactivity."

The staff at Frazier clinic treats these problems and also works to prepare children for a healthy future, Valukas says. "If you can get kids earlier with preventive health messages, you're setting them up for a lifetime of good health behaviors, hopefully developing strong relationships with the health care system," she says.

For Rush medical and nursing students, these clinics also serve as a real-life training ground for clinical experience. At Frazier clinic, for example, the staff treats 55 asthmatic children. Janiece Stewart, a fourth-year medical student at Rush who works three days a week at Frazier, is helping to design an educational program so students can learn the triggers that can cause an asthma attack and how to best use their medications.

"Through school-based health centers, we are providing not only an educational opportunity for medical and nursing students but also an incredible service to the community — to real people," Cowell says. "It's a fabulous example of the Rush mission integrated into what we do." ■

Do you know how old you *really* are?

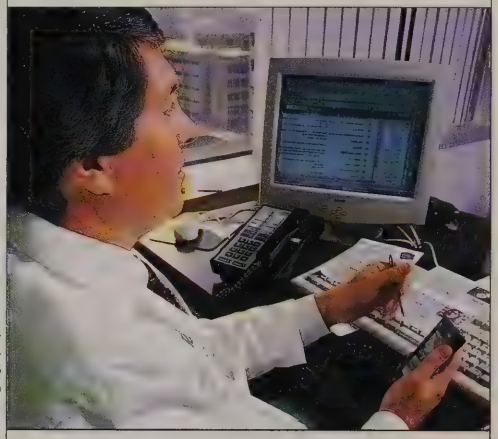
Coronary heart disease, the leading cause of death in the United States, affects millions of people each year. It develops slowly, over many years, and if nothing is done to reverse the effects of the disease, it can eventually cause a heart attack, stroke or other serious cardiovascular problem.

Many factors can contribute to heart disease, including age, high blood pressure and LDL, or "bad," cholesterol levels, smoking and being overweight. But according to Michael H. Davidson, MD, director of preventive cardiology at Rush, while each factor increases the risk of heart disease, having several "mild" risk factors actually poses a greater risk than having one "severe" risk factor.

"If your cholesterol is 310, that sounds bad. But if your cholesterol is only slightly high, say 210, but you also have mildly high blood pressure and you smoke, that's actually worse than having a cholesterol level of 310 with no other risk factors," Davidson says.

"What this means is that cardiologists should address risk factors collectively, rather than independently."

That's why he developed Mobile Lipid-Clinic.com, a palm pilot program that assesses a patient's "global risk" for coronary heart disease — and determines which patients will benefit the most from risk factor modification.



Photography by Bill Richert

Rush cardiologist Michael H. Davidson, MD, demonstrates his new palm pilot program for physicians, which uses a variety of risk factors to determine a patient's "adjusted" or "cardiovascular risk" age.

Davidson's program is currently being tested by 1,000 cardiologists nationwide.

To use the program, the cardiologist plugs in a patient's age, sex, height, weight, family history of heart disease, how much he or she smokes, blood pressure, whether he or she is being treated for high blood pressure, and HDL and LDL cholesterol levels. If a patient has had a heart scan — a test that determines whether calcium has built up in the coronary arteries — the calcium score is also entered in. Based on this data, the program determines that patient's "adjusted" or "cardiovascular risk" age.

The goal is to lower your adjusted age, by reducing the necessary risk factors, until it is the same as your actual age.

With the easy-to-use program, cardiologists will chart their patients' progress in reaching their cardiovascular goals. They will then transfer the data into a centralized computer server, so it can be evaluated and measured against a national standard.

"It's a good way of making sure that both cardiologists and patients are looking at the big picture," Davidson says.

— by Judy Grossman

Thalidomide: An old drug offers new hope for patients with pre-leukemia

For many, the drug thalidomide is a painful reminder of one of medicine's darkest periods. But for researchers and patients, it offers new possibilities in the fight against cancer.

In the 1950s and 1960s, thousands of babies were born with severe deformities, such as missing or misshapen limbs, as a result of the morning sickness drug thalidomide. Although it was pulled from the market in 1962 (it was never available in the United States), the drug has long been a source of great interest in the research community. And in recent years, it has been evaluated in the treatment of a variety of illnesses — from leprosy to AIDS to cancer. "The thought behind the research has been that, if thalidomide is powerful enough to stop limbs from growing, perhaps it can prevent cancer or other diseases from progressing," says Azra Raza, director of Rush's Myelodysplastic Syndrome Center.

Photography by Steve Gadomski

Azra Raza, MD (center), with members of her clinical research team Laurie Lisak, MMS, PA-C (right) and Lisa Santroy, PA-C (left).

But what was once a hunch is now backed up by promising findings, which include Raza's results in 83 patients with myelodysplastic syndrome, or pre-leukemia — a condition that can lead to acute myeloid leukemia. Myelodysplastic syndrome represents a group of disorders in which the bone marrow does not function normally and not enough red blood cells, white blood cells and platelets are produced. These cells are the body's natural defense system against many diseases, including cancer.

In the study, 30 to 40 percent of patients responded favorably to treatment with thalidomide. The reason? Thalidomide's ability to suppress the production of cytokines — proteins that play a role in causing important bone marrow cells to "commit suicide" — and to block the formation of the blood vessels needed to make tumors grow. The drug also appears to have a positive impact on the body's immune system.

Raza has had even more encouraging results in patients given thalidomide in combination with other treatments such as low-dose chemotherapy and other anticytokine agents, with a 40 to 50 percent response rate.

"Right now, the standard treatment for MDS is blood transfusion, which is very hard on patients," Raza says. "Our hope is to find gentler, more effective treatments. Thalidomide may be part of that."

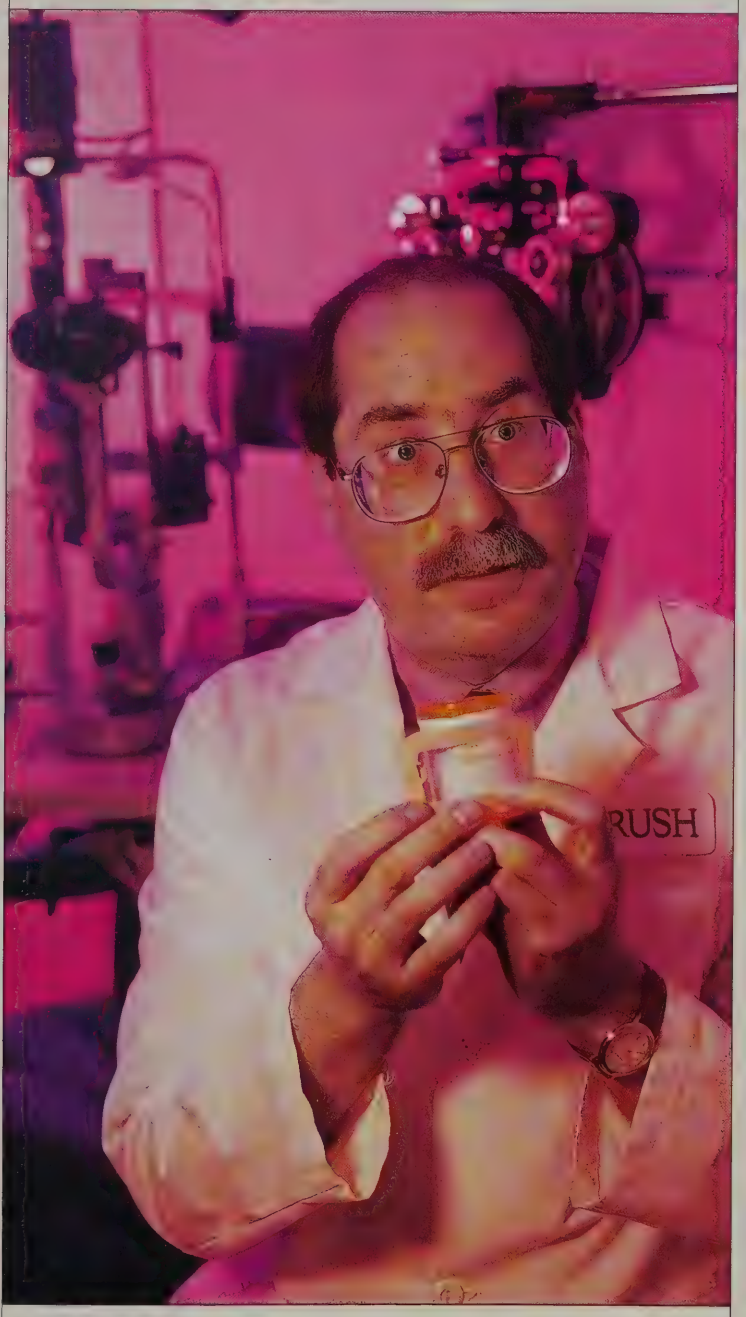
As for the risk of patients having children with birth defects, Raza has ensured that women in her studies are all postmenopausal. And when the time comes for younger women to be evaluated, pregnancy tests will be part of the screening process. "The drug company and researchers are taking every precaution to ensure safety," she says. "Our patients' safety is always our highest priority."

— by Jill Waite

Easy on the eyes: improved prescription labels could reduce the number of medication errors

As we get older, our eyesight becomes weaker and weaker. Combine poor eyesight with the abundance of drugs that doctors prescribe to combat the effects of aging, and you get a troubling scenario — the inability to read important medical instructions on the prescription labels clearly.

"This can endanger the health of the patient and lead to additional health care costs," says Rush optometrist and pharmacist Bruce Gaynes, OD, PharmD. "For example, if you don't know that you're supposed to take certain medications with food, you may develop significant gastrointestinal problems requiring a trip to the doctor for additional care and maybe even more prescriptions."



Photography by Andrew Campbell

Bruce Gaynes, OD, PharmD, demonstrates how an audio device can read prescriptions for patients by activating a microchip that has been placed on the back of the prescription label.

But what if that prescription label could talk? Or — a simpler, less high-tech concept — what if all the prescription labels in the country looked the same, with the same easy-to-read type and all the instructions in the same place on each and every label in the medicine cabinet? Would that make a difference in preventing potentially deadly medication errors?

Gaynes thinks so. That is why he's heading up a pilot study with the help of Scott Sonnenschein, assistant vice president of health delivery management at Rush, and Martin Gorbien, MD, head of the section of geriatric medicine, to evaluate how well a group of individuals at Rush's Johnson R. Bowman Center for the Elderly and the Chicago Lighthouse for the Blind can read prescription labels without assistance. In this observational study, subjects will be asked to identify and read the prescriber's name, the number of refills, the instructions for use and any special instructions, such as "take with meals only." Investigators will then assess how many errors are made and the ease with which the labels are read.

Once that part of the study is complete, investigators will evaluate the effectiveness of two approaches to help patients understand the information on the labels: an audio device that reads the label information aloud, and a specially designed prescription label with larger type size and a greater contrast between the color of the text and the label itself.

"A lot of elderly people live alone and want to remain independent. If these approaches can help them manage their medications safely without a caregiver, I think that's a major benefit," Sonnenschein says.

In fact, Gaynes hopes to extend the benefits of improved labeling to more than just those with vision problems. He hopes that the data they collect will help transform how prescription labels are produced throughout the country.

"Currently, prescription labels have no uniformity," according to Gaynes. "One of our goals is to help develop governmental guidelines for standardized prescription labels so that all patients can easily understand essential information, and confusion and errors can be avoided."

— by Jill Waite

Photography by Bruce Powell

The four story Rush/Barton Center at 1245 South Wood Street, in the heart of the Illinois Medical District, is the Chicago area's first supportive living center for low-income elderly residents.

Rush/Barton senior center opens

Independence Day came early to the West Side this year. On Jan. 9, Illinois Governor George Ryan joined Rush President and CEO Leo M. Henikoff, MD, and others at dedication ceremonies for the Rush/Barton Senior Living Residence, the Chicago area's first supportive living center for low-income elderly residents.

The supportive-assisted living center concept allows older adults to enjoy the independence of their own apartment while receiving the assistance that is necessary to maintain that independent lifestyle," says Martin J. Gorbien, MD, director of Rush's section of geriatric medicine and the Johnston R. Bowman Health Center. Rush's integrated approach to senior care, says Gorbien, already includes outpatient care, acute care in the hospital, rehabilitation, nursing facilities and home care.

The Rush/Barton Center is not a medical facility, but its specially trained staff will assist elderly residents with daily living activities, including taking their medications, bathing and grooming.

Barton Senior Care will staff and manage the center, and staff from Rush will develop health and wellness programs for its residents.

The four-story apartment building, located at 1245 South Wood Street in the Illinois Medical District, is a joint venture of Rush and Barton Senior Care, LLC. The Illinois Housing Development Authority provided construction and permanent financing for the project, which was designed for seniors whose incomes fall below a certain level.

In addition to 139 private apartments — a mix of studios and two bedrooms — the Rush/Barton Center has extensive community space, such as a sunroom, a TV lounge and a library. Also helping to foster socializing, the center offers a daily roster of activities, including morning stretching classes, discussions of current events and group shuttle trips to the grocery store.

"This facility is outstanding," commented Gov. Ryan, who took a tour of the center. "Loss of independence is one of our biggest fears. Here, seniors can live privately, independently and with dignity. The key is to pay attention to the quality of life. Certainly that is being done here."

— by Sean Carr

Photography by Bruce Powell

Illinois Governor George Ryan (back) went on a tour of Rush/Barton that included a visit to one of the center's 139 private apartments, which, like the library and the TV lounge, are designed and furnished to help residents feel right at home.

Recent appointments at Rush

After several months as acting dean, **Larry J. Goodman, MD**, has been named the Henry P. Russe, MD, Dean of Rush Medical College. Goodman, who has been at Rush since 1976, is also senior vice president of medical affairs. He previously served as assistant dean of clinical curriculum, associate dean of medical student programs and director of inter-institutional affairs for medical affairs at Rush Medical College.

Joan Zajtchuk, MD, has been named associate dean for university programs. Before coming to Rush in 1999 as associate dean for medical student programs, Zajtchuk served in several positions at Walter Reed Army Medical Center, including chief operating officer and associate dean for academic affairs, and as a special assistant to the Army Surgeon General. She graduated from the University of Chicago School of Medicine, where she also trained in otolaryngology, and in 1996 she earned her degree in health sciences administration from George Washington University.

Susan Jacob, PhD, has been appointed acting associate dean for medical student programs. Jacob, who received her PhD in anatomy from Loyola University of Chicago, has served as course director of medical gross anatomy and has developed and participated in the anatomy portion of Rush Medical College's alternative curriculum. Her teaching has won her recognition from Rush Medical College students, who have selected her to deliver the welcoming address to seven incoming classes and given her the Brainard Award, honoring the outstanding basic science teacher, four times.

Frank Assadi, MD, has joined Rush as director of the section of pediatric nephrology and professor of pediatrics. He comes to the Medical Center from Philadelphia's Jefferson Medical College — duPont Hospital for Children, where he was professor of pediatrics and chief of the division of nephrology. Assadi received his medical degree from the Tehran University School of Medicine. His research interests include the effects of prenatal drug and alcohol use on neonatal kidney functions.

Michael H. Davidson, MD, has been named director of preventive cardiology. Davidson, an associate professor of medicine at Rush and a board-certified cardiologist, is president and CEO of the Chicago Center for Clinical Research. His extensive research on statins, novel lipid-lowering drugs and nonpharmacological risk factor reduction has established him as a key expert in this area. During his career, he has coordinated more than 500 clinical trials in areas of preventive cardiology and published more than 100 articles in medical journals.

Martin J. Gorbien, MD, has been named director of the Johnson R. Bowman Health Center for the Elderly. Gorbien is currently head of the section of geriatric medicine, director of Rush's fellowship program in geriatric medicine at Rush and a Fellow of the American Geriatrics Society. The Rush geriatrics program was ranked 15th in the nation in the 2000 *U.S. News and World Report* rankings, and Gorbien was included in *Chicago* magazine's annual listing of the "Top Doctors" in Chicago, which was published in January 2001.

Steven Rothschild, MD, was appointed section director of community and social medicine in the department of preventive medicine. Rothschild received his medical degree from the University of Michigan in 1980, and in 1984 joined Rush's Department of Family Medicine, where he established the Neighborhood Family Practice of Pilsen to treat patients in one of Chicago's underserved areas. Along with his new appointment, Rothschild will continue to serve as family medicine's associate chairman of clinical services.

Larry Goodman, MD

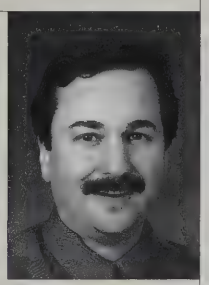
Joan Zajtchuk, MD

Susan Jacob, PhD

Frank Assadi, MD

Michael Davidson, MD

Martin Gorbien, MD

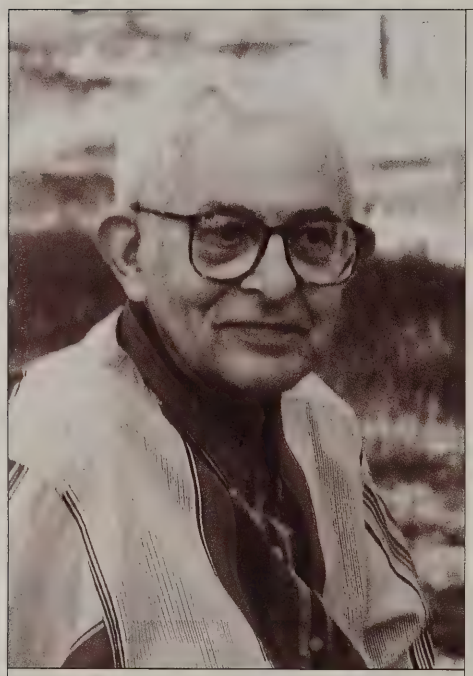

Steven Rothschild, MD

Rush elects new trustees

Lester H. McKeever, Jr., was elected a general trustee. McKeever is managing principal of the law firm Washington, Pittman & McKeever, LLC. He joined the firm in 1959 as a staff accountant and was elected managing partner in 1976. McKeever, a licensed CPA and attorney, is a former chairman of the Chicago Urban League and Chicago United.

Richard Sharfstein, chairman of the board of trustees of Rush North Shore Medical Center, was elected an annual trustee. Sharfstein is the founder and chairman of the board of Pride Container Corporation, and he has co-founded three other companies: World Paper, World Xpress and Display Graphics. He also serves on the board of Rush North Shore Health Services.

In Memoriam:
Rush says good-bye to two dedicated physicians



John Clark, MD, devoted much of his life to research, advancing radiology — both in the lab and in society — in large ways and small.

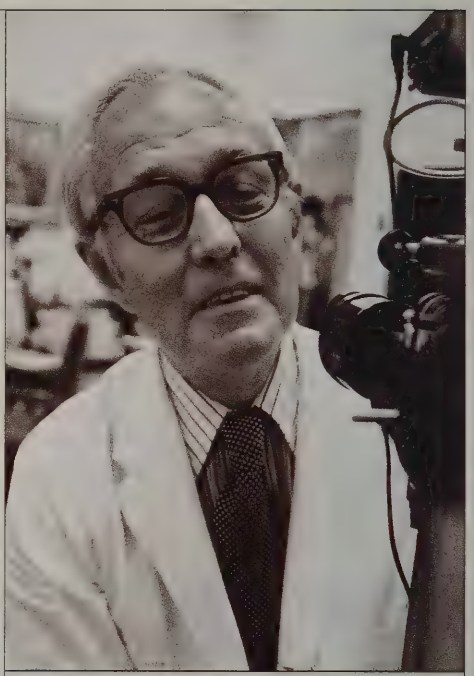
John Clark, MD, who spent 35 years at the Medical Center, died at home on Dec. 8 of last year. He was 82.

A graduate of the University of Chicago and Harvard Medical School, Clark first came to Presbyterian Hospital as an intern in 1943. During World War II, he was stationed in England as a captain in the U.S. Army. He returned to Presbyterian Hospital for his radiology residency and, after studying applied nuclear physics at the University of California, he joined the Presbyterian staff in 1950.

An enduring passion for physics and mathematics led Clark to devote much of his professional life to research. Between 1952 and 1956, he was an associate scientist in Argonne National Laboratory's division of biological and medical research. He also served on the editorial board of the journal *Radiology* for 20 years, and in 1969 he was awarded the first patent for a medical diagnostic system using ultrasonic waves.

Clark is also remembered as a strong supporter, in the late 1960s, of the appointment of the first woman to the hospital's radiology department. "Some of the men were very much against his support of a woman radiologist," said Mary Clark, his wife of 39 years. "She was good at what she did and that was what was important to him. Now, a large percentage of their residents in training are female."

Clark's dedication to lifelong learning is honored through the Rush Department of Diagnostic Radiology's John W. Clark, MD, Endowed Lecture Series.



A giant in his field, William F. Hughes, MD, was chairman of ophthalmology at Rush for more than 20 years.

William F. Hughes, MD, longtime chairman of ophthalmology at the Medical Center, died Jan. 30 at the age of 87.

Hughes was raised in Indianapolis, where his own father practiced as one of the first formally trained ophthalmologists in the United States. The younger Hughes graduated from Amherst College, in Massachusetts, in 1934, and earned his medical degree from Johns Hopkins University four years later. After a residency at the Wilmer Eye Institute and an appointment at Johns Hopkins, Hughes assumed leadership of the Department of Ophthalmology at the University of Illinois medical school in 1947, joining the Presbyterian Hospital medical staff that same year. In 1956, he became chairman of ophthalmology at Presbyterian-St. Luke's Hospital, a position he held for 23 years, through the merger with Rush Medical College that formed the Medical Center.

Throughout his career, Hughes broke new ground in treating burns of the eye and in using radiation to treat various eye problems.

"He was a giant in the ophthalmology world," Thomas Deutsch, MD, current chair of ophthalmology at Rush, told the *Chicago Tribune*. "He made observations 50 years ago that are still valid today."

His numerous publications included the 1953 book *Office Management of Ocular Diseases*. He was also a past president of the Chicago Ophthalmology Society.

— by Sean Carr

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Rush Record

Fall/Winter 2001-2002

Publication of Rush-Presbyterian-St. Luke's Medical Center

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Beating the Odds in Lung Cancer

Protecting Our Elderly

Preventing abuse of the nation's elderly requires a partnership between health care professionals and the public.

RushRecord
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Cover photo by Andrew Campbell

RushRecord is a publication of Rush-Presbyterian-St. Luke's Medical Center, produced by the Office of Philanthropy and Communication.

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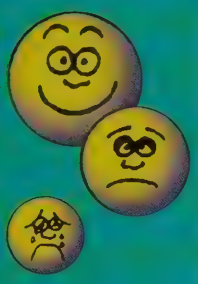
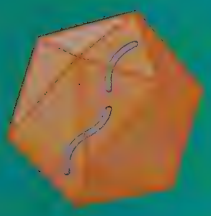


Pain assessment joins temperature, pulse, respiration and blood pressure as the fifth vital sign.



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Against all odds

Every Thursday they gather — surgeons, medical oncologists, radiation oncologists, nurses and residents — to offer advice based on years of experience and training to a waiting room full of people confronting their worst nightmare: a diagnosis of cancer. And as if cancer itself wasn't terrifying enough, these men and women face one of the deadliest cancers of all — lung cancer, a cancer with an overall five-year survival rate of just 14 percent.

by Jill Waite

Photography by Bill Richert

Although the odds are against many of their patients, the doctors and nurses who treat lung cancer at Rush believe that they are battling a disease that can be beaten. To accomplish that, though, progress needs to be made on several fronts: prevention, diagnosis and treatment.

The cigarette connection

The health care providers who participate in Rush's weekly Chest Tumor Clinic may have different backgrounds, different areas of expertise and, on occasion, different opinions, but they all agree on one thing — cigarettes kill. Although not all lung cancers arise from cigarettes — many have been linked to asbestos, radon and other agents — it is believed that more than 85 percent of lung cancers are caused by smoking.

"The most important thing about lung cancer is that it has a very identifiable risk factor, and if people would stop smoking we could significantly reduce the incidence of lung cancer," says William Warren, MD, director of thoracic surgery at Rush.

Doctors at the Rush Cancer Institute take smoking very seriously. They counsel their patients — and their patients' families — regularly about the dangers of smoking and secondhand smoke, often referring them to Megan Mills, PhD, director of psychosocial oncology at Rush. As a smoking cessation specialist, Mills helps Rush patients and their families kick the habit and, along with doctors like Philip Bonomi, MD, director of medical oncology, she takes her messages about smoking to the street when she lectures to community groups around the Chicago area.

Early detection can mean cure

But health care professionals face formidable foes in helping prevent lung cancer in the forms of advertising and nicotine, the element in cigarettes that makes them addictive. So when it comes to improving survival rates for lung cancer, most experts agree that it won't be done by education and outreach alone; early detection is a key component of any plan to save lives. "If you pick it up early, lung cancer can be cured," Warren says.

But symptoms of lung cancer — such as a persistent cough, chest pain and weight loss — often do not occur until the disease has advanced; therefore, only about 15 percent of lung cancers are found before the cancer invades neighboring lymph nodes and other regions. And with lung cancer, the progression of disease is almost inevitable if left undiagnosed and untreated, because the lung's extensive network of blood and lymph vessels circulates cancer cells to other parts of the body, such as the brain and liver.

For the fortunate few who are diagnosed early in the disease process, however, the five-year survival rate is about 65 percent, a far better outcome than the 14 percent survival rate for the remaining 85 percent.

Years ago, most studies on the use of chest X-rays and sputum cytology (the evaluation of phlegm for cancer cells) concluded that lung cancers could not be detected early enough to improve a patient's chances for a cure. However, an imaging technique called multidetector low dose spiral computed tomography (CT), currently offered at Rush and used as part of its

Images courtesy of Thomas Zoros, MD

Advances in technology have allowed radiation oncologists to more accurately target lung cancers without harming internal organs, such as the heart. With multidimensional images, radiation oncologists create treatment plans that pinpoint how and where radiation should be directed.

During clinic, surgeons, medical oncologists and radiation oncologists determine the best course of action for each patient.

Photography by Bill Richert

Photography by Loren Santow

Photography by Bill Richert

lung detection program, has been shown to be much more adept at finding early growths, says John F. Hibbeln, MD, director of computed tomography at Rush. "Spiral CT takes much less time than older CT methods — only about 30 seconds. Since diagnostic accuracy depends largely on a patient's ability to hold his or her breath and remain still, this is very important," he says.

But even though it's fast and sensitive, using spiral CT as a screening mechanism for lung cancer doesn't provide the simple solution one would expect.

Unlike mammograms, diagnostic spiral CTs are not always covered by insurance companies. And since there are no standard guidelines about what doctors should do when spiral CTs pick up nodules 1 cm. or smaller (about the size of an eraser head), there's a great deal of debate in the medical community about what should be done next.

"We need to define what we're going to do with the very small nodules," says L. Penfield Faber, MD, acting chairman of the department of cardiovascular-thoracic surgery. "Unfortunately, just by looking at them, we don't know if they're benign or malignant. And anything less than 1 cm. in size is difficult to biopsy with a needle. Performing major surgery on something that we can't identify isn't really a viable option."

Fortunately, studies are currently under way that will give doctors a better road map as to the best course of action for these patients, Faber says. Until then, doctors can look for changes in small nodules to see if intervention is necessary.

Putting together a treatment plan

The patients who come to Rush's Chest Tumor Clinic seeking help, though, aren't usually the ones with tiny specs on their spiral CTs; they're the ones who have larger growths, many of which have been confirmed by biopsy to be cancer.

During clinic, surgeons, medical oncologists and radiation oncologists group around scans and X-rays to determine the best course of action for each patient. This depends on many factors, including the type of cancer (nonsmall cell lung cancer vs. small cell cancer), the size of the tumor and how far and where the cancer has spread. If caught early enough, patients can often undergo surgery to remove the tumor with no additional treatment. Or if the cancer is in the windpipe, patients can sometimes undergo laser therapy to destroy the cancer.

In photodynamic therapy, a new form of laser therapy for lung cancer that is present in the windpipe, doctors give patients a drug that is selectively retained in cancer cells. When the drug is activated by a laser, it causes the cancer cells to die, and patients eventually cough up the dead cells. Currently, Rush is the only academic medical center in Chicago to offer this treatment.

For patients with locally advanced disease, doctors usually apply a multipronged treatment strategy, consisting of chemotherapy, radiation and surgery. Combined treatment modalities have resulted in prolonged survival times and an increased percentage of long-term survivors, says Bonomi.

Advances in software and imaging techniques — such as spiral com-

Top (from left to right): *Members of the Rush Chest Tumor Clinic team — Mary Ellen Hand, RN; Amod Saxena, MD; Philip Bonomi, MD; Thomas Zusag, MD; William Warren, MD; L. Penfield Faber, MD; and Lucio Di Nunno, MD.* ***Center:*** *William Warren, MD, uses photodynamic therapy to destroy cancer cells in the windpipe.* ***Bottom:*** *Oncologist Philip Bonomi, MD (left), and radiation oncologist Thomas Zusag, MD, review spiral computed tomography scans.*

puted tomography and positron emission tomography — have allowed radiation oncologists like Thomas Zusag, MD, to plan how they will deliver radiation beams safely to patients (see images on p. 3). "We use those images to determine the best way to aim the radiation. In radiation therapy, technique is everything," Zusag says. Since many lung cancers lie dangerously close to the spinal cord and heart, Zusag and his colleagues must be precise or the consequences of treatment could be more devastating than the cancer itself. But by using images to create three-dimensional visual reconstructions of tumors and where they lie in the patient's body, radiation oncologists can more effectively zero in on the cancer — not the patient's vital organs.

Since it was originated in the 1980s at Rush, one approach — which combines radiation, chemotherapy and surgery — appears to improve cure rates in patients once given little hope of survival.

When the tumor is too large to remove surgically or it is located in an area of the chest that makes surgery dangerous (e.g., near the heart), chemotherapy and radiation therapy are sometimes used to shrink the tumor to allow for complete surgical resection. This "pretreatment," called neoadjuvant therapy, was pioneered by Faber almost 20 years ago. Since then, he has seen cure rates increase from 10 percent to as much as 30 percent in patients with clinically advanced lung cancer. "But with 70 to 75 percent of these patients still dying, it's obviously still a very bad disease," Faber says.

That's why health care professionals are attacking lung cancer — as well as all other forms of cancer — on a molecular level, a strategy that will eventually offer new and better options for patients. At Rush, several drugs have been under investigation that may become part of health care's tool kit in the fight against lung cancer or at least provide valuable clues as to the next step in research.

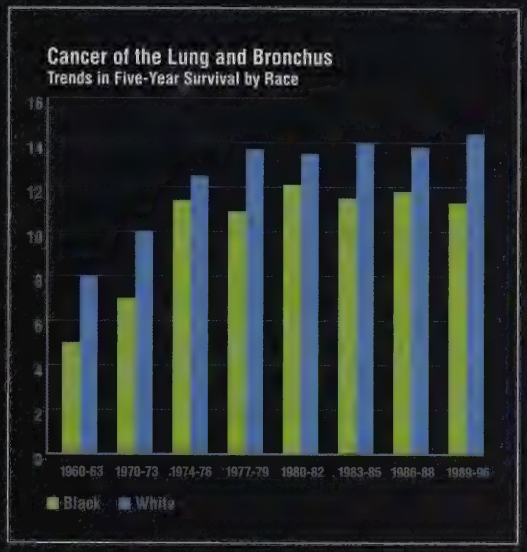
On the horizon

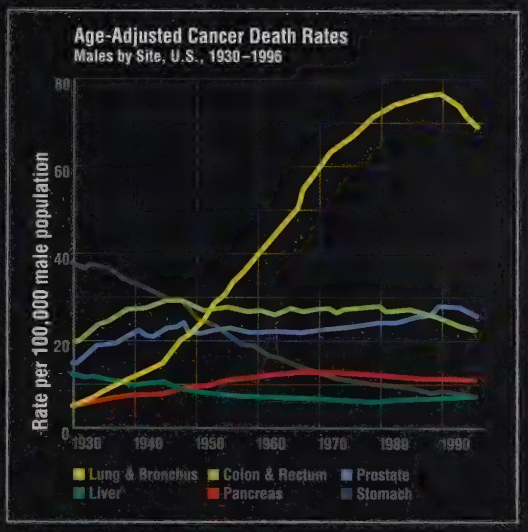
A better understanding of how cancer cells are structured and how they operate has opened many avenues of research and treatment. Researchers now know that, like a snowflake, each cancer — in each individual — is unique. What may be successful in treating one person with one kind of cancer may not be successful in treating another with a similar disease. And what fails in one patient may cure another.

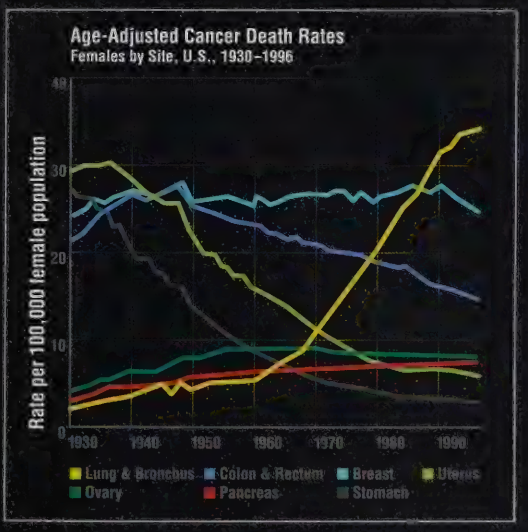
At Rush, promising results have been obtained with a drug called Tarceva. By blocking enzymes that cause some tumors to grow, Tarceva forces these tumors to regress and shrink. Of the 22 patients screened for this study, 16 had tumors with the particular molecular structure that Tarceva is programmed to attack. Of the 16, three patients responded favorably to treatment; one had a sustained remission. "The responses observed in patients receiving Tarceva alone were exciting because the cancer in each of these patients had progressed after treatment with multiple types of chemotherapy and because Tarceva has fewer side effects than chemotherapy," Bonomi says. "Next, we plan to use Tarceva in combination with other drugs. We're optimistic that the results will be even better with this approach."

Researchers and clinicians at Rush are also optimistic that they will eventually find the right mix of drugs, radiation therapy, chemotherapy and surgery for a cure. With each new combination they try, they believe they're getting closer to an approach that works. Although individual successes may not mean a cure for everyone with lung cancer, they do offer hope that can make impossible dreams possible.

And it is with hope, determination and a lot of know how that a team of health care providers meets every Thursday at Rush, to make a difference in treating lung cancer, one patient at a time.







Graphs courtesy of the American Lung Association.

The Fifth Vital Sign

by Jill Waite

Photography by Andrew Campbell

Temperature. Pulse. Respiration. Blood pressure. Sound familiar? That's because they're the vital signs that get checked each and every time you visit a doctor's office or the hospital.

It's part of the routine; it's something to expect — usually before stripping down and putting on the paper gown. But the fact that they're commonplace doesn't mean these steps aren't important. They are, after all, called *vital* signs for a reason. Spiked temperature, erratic pulse, labored breathing — these can signal serious health problems, such as infection or respiratory distress.

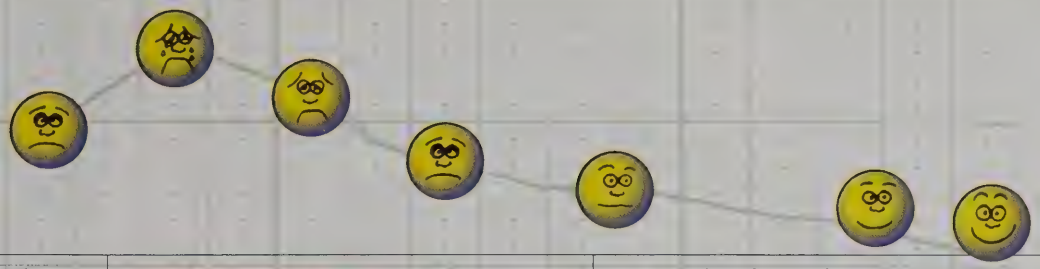
In early 2001, another important, yet often forgotten, indicator of overall health — pain — was added to the vital sign checklist in hospitals around the country. "Often pain is seen as a symptom of something rather than a problem to be managed in its own right," says Timothy Lubenow, MD, co-chair of Rush's Global Pain Initiative. "But research shows that unrelieved pain can interfere with healing and turn into a chronic problem."

Unlike its counterparts, however, there is no gadget to measure pain; it must be evaluated by asking questions and observing behavior. And unlike temperature or blood pressure, getting accurate data about pain depends on two-way communication between the health care professional and the patient.

How pain is assessed

In a hospital environment, nurses initially assess pain by asking patients, upon admission, to describe their pain using a scale from 0 to 10, with zero being no pain at all and 10 being the worst pain imaginable. Depending on the answer, nurses may also ask about the location, quality, duration and pattern of pain.

Nurses then record — right along with the patient's temperature, pulse, respiration rate and blood pressure — the responses on the patient's database and graphic records. Doctors, in turn, refer to the nurse's assess-



ments when they first see the patient. They also ask more specific questions about the pain: What makes the pain worse? What makes it better? Is it new, or has it been going on for a long time?

Based on that information, the doctor — often in collaboration with pharmacists and nurses — develops a pain management plan. And during a patient's stay, nurses ask questions about pain relief or further discomfort.

"We're looking at pain as any another clinical problem and then assessing it as frequently as clinically indicated," says Rita Wickham, RN, PhD, co-chair of the Global Pain Initiative.

Barriers to assessment

But when gathering information about pain, health care professionals are confronted with several obstacles. One major barrier is how people view pain, says Monica Malec, MD, co-chair of Rush's Global Pain Initiative, along with Wickham and Lubenow. "It's an ingrained value in our society to endure pain," she says. "Women who go through childbirth naturally, for example, are placed on pedestals whereas people who don't handle pain well are looked down upon."

A big part of health care's job today is to educate patients that it's okay to talk about pain and that, in fact, pain is the body's way of sending up a red flag that something is wrong.

Misconceptions about the connection between drug addiction and pain medications also shape perceptions of pain and how it is managed. Tales of Hollywood stars who end up at the Betty Ford Clinic for pain killer addictions have made many wary of using drugs to alleviate pain or discomfort. If the truth be known, though, getting hooked or addicted to pain medications is very rare, says Malec.

In addition, some may worry that if they take too much medication, the drugs will stop working. Although patients usually become tolerant to the side effects of strong medications after a short time, tolerance is uncommon and usually not a problem with pain treatment, Malec says. If the medication does become less effective, either the doses or the medicine can be changed.

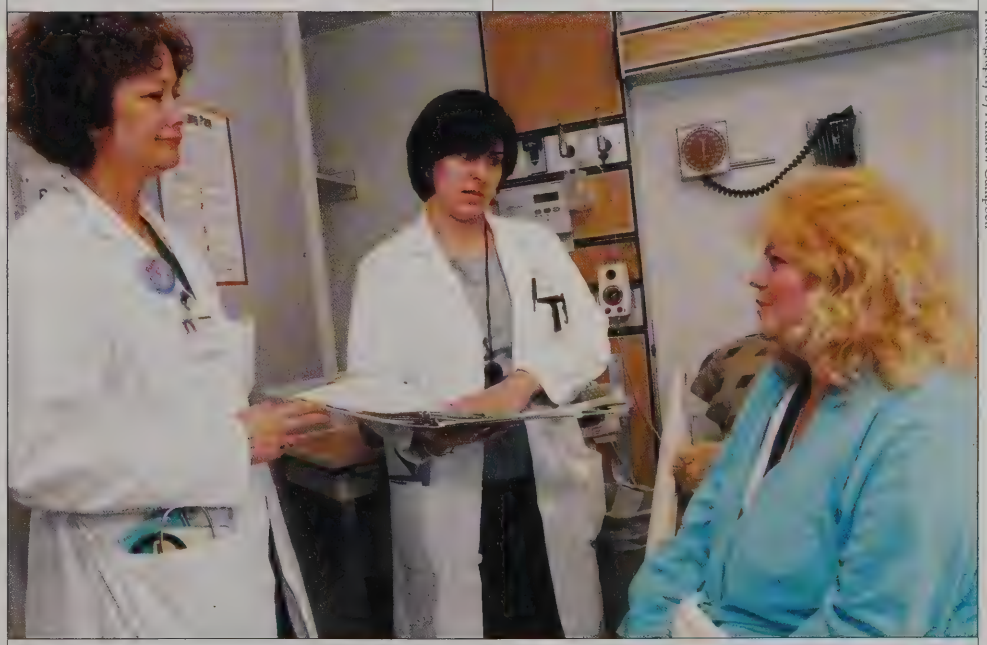
A proactive approach

For Wickham, Lubenow and Malec, the focus on pain is nothing new. "At Rush, assessing pain and alleviating it have always been priorities," says Wickham, who has been an advocate for pain assessment and management for most of her 26-year career. In fact, the Rush Pain Center, under the direction of Anthony Ivankovich, MD, chairman of anesthesiology, is one of the oldest programs in the country devoted to the management of pain. In addition, the Pain and Palliative Care Service at Rush has been in existence for three years. This interdisciplinary team helps doctors and nurses manage pain and other symptoms better. But with pain now officially considered the fifth vital sign by the Joint Commission on Accreditation of Healthcare Organizations, Rush has taken an even more proactive role in encouraging patients to talk about their pain and sensitizing staff and medical and nursing students to issues related to pain, especially when it comes to populations who may have trouble communicating, such as infants and the cognitively impaired.

For these patients, health care professionals use different methods to assess pain. For instance, in the neonatology unit, prolonged crying and squirming may indicate a problem. So even though an infant can't say, "Ow, my tummy hurts," close and regular observation may provide important clues. For the cognitively impaired, a cartoon-based chart, such as the one shown above, can help shed some light on the patient's condition.

With posters that address common concerns about managing pain in every patient's room at Rush and more involvement from hospital staff, health care providers hope that patients will leave their fears and "grin and bear it" attitudes about pain at the door. "We have medications that can handle most acute pain — the kind of pain we most often see in the hospital — so there's no reason that we can't prevent unnecessary suffering," Malec says.

By increasing awareness among health care professionals and patients about pain, Rush's Global Pain Initiative team is strengthening the partnership between these two groups so that ongoing discussions about pain will become second nature for everyone. And eventually, when nurses ask patients to rate their pain, along with reading their blood pressure and temperature, the question won't seem unfamiliar, and when patients feel discomfort or pain, they won't hesitate to voice it. ■



Photography by Andrew Campbell

Rita Wickham, RN, PhD (left), and Monica Malec, MD, evaluate a patient's pain by asking questions, such as "What makes the pain worse?"

Hepatitis C is a reality for roughly 4.5 million Americans. It doesn't discriminate; it affects men and women, young and old, rich and poor.

Launching New Offensives

Bill Kenny was diagnosed with hepatitis C in 1998. Today he is virus free.

Bill Kenny and his daughters.

Against Hepatitis C

by Judy Grossman

"I never thought it could happen to me," says 47-year-old Bill Kenny. "Nobody thinks it can happen to them."

But the "it" to which Kenny is referring — hepatitis C infection — is a reality for roughly 4.5 million Americans. And it doesn't discriminate; it affects men and women, young and old, rich and poor. You don't have to be an alcoholic or IV drug user or have unprotected sex to get it, although these behaviors do increase a person's risk considerably.

Before being diagnosed, Kenny knew nothing about the disease. He remembers hearing a public service announcement on the radio about the importance of being tested for hepatitis. But like many Americans, he didn't think twice about it — until the day in 1998 when he went to the doctor complaining of chest pain. Blood tests revealed not heart disease but an elevated level of liver enzymes, an indication of an abnormality in the liver. "The doctor told me I should have a hepatitis C test," Kenny says. "I eventually did, and that's when I found out I had it."

Hepatitis is an inflammation of the liver, either acute or chronic, most often caused by one of the five major hepatitis viruses: A, B, C, D or E. However, it may also be caused by other viruses, such as Epstein-Barr virus; by alcohol abuse or use of certain chemicals and drugs; or by autoimmune disorders.

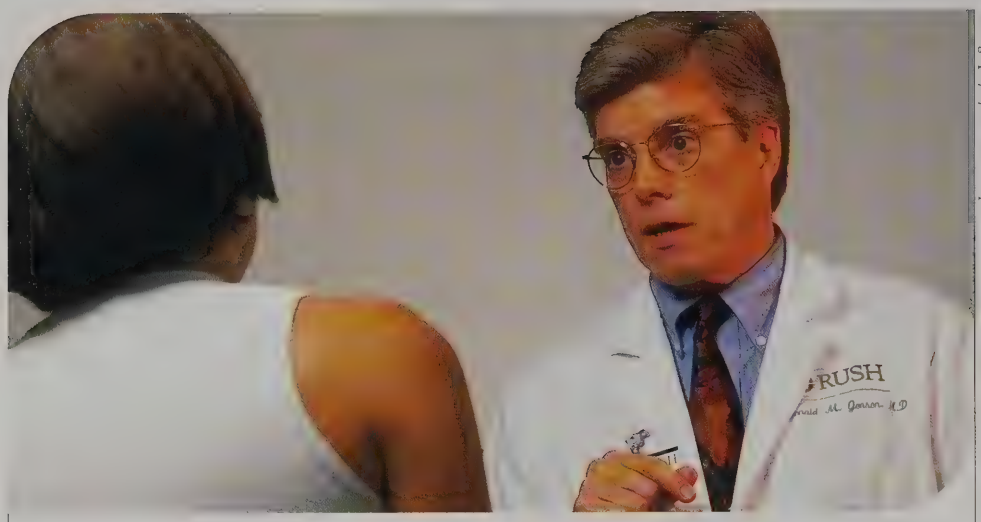
The most common of the five hepatitis viruses, hepatitis C affects four times as many people as HIV, and nearly 10,000 people die from it each year. It is spread by contact with the blood of an infected person. Long-term infection with hepatitis C can lead to chronic liver disease, cirrhosis and liver cancer.

One reason Kenny didn't realize he had the virus is that he didn't feel sick. Most people with hepatitis C don't, which is why as many as 60 percent go undiagnosed until the late stages, when the signs of advanced liver damage — jaundiced skin and eyes; a fluid-swollen abdomen; wasted facial and arm muscles — are highly visible.

"The primary symptom in the early stages is fatigue, which is easily shrugged off or attributed to other conditions, such as the flu or being stressed or overworked," says Donald Jensen, MD, director of hepatology and the Richard B. Capps, MD, Professor of Hepatology at Rush.

Kenny had a pulled chest muscle to thank for sending him to the doctor's office. After the diagnosis, he was referred to Rush hepatologist Scott Cotler, MD, who enrolled him in a clinical trial for a promising new hepatitis C treatment that started him on a path toward a cure.

Photography by Andrew Campbell



Photography by Andrew Campbell

Donald M. Jensen, MD, director of the section of hepatology, discusses the latest treatment options with a patient.

Interferon revolution

But the path that gave Bill Kenny his life back didn't even exist before 1985. That's when drug companies found a way to mass produce interferon, revolutionizing the treatment of this once incurable disease. And today, thanks to vast improvements in interferon-based treatments over the past 16 years, more and more people with hepatitis C are finding hope.

"We used to talk about controlling the disease, not curing it," says Jensen. "When I tell patients now that they have a good chance of being cured, many of them look at me like I have two heads. But there's indisputable data that hepatitis C can now be cured in about 55 percent of all cases — and that number will increase as new drugs get tested and approved."

Interferon is the body's first line of defense against viral infection; but the body doesn't produce enough of this chemical on its own to help the immune system destroy a fast-multiplying and rapidly mutating virus such as hepatitis. Rush was among a handful of medical centers nationwide to participate in the first clinical trials to test mass-produced interferon's efficacy and safety in treating what was then known as non-A, non-B hepatitis.

By the time non-A, non-B was identified as hepatitis C in 1989, the first interferon trials were well under way. And while the results didn't exactly set the medical world on fire — only 10 to 20 percent of patients treated with interferon were sustained responders, meaning they were virus-free six months after treatment ended — those early trials proved that interferon was capable of eradicating certain strains of the virus; it just needed a little help.

The hepatitis C virus is difficult to kill — and to develop a vaccine for — because it multiplies quickly and mutates rapidly in response to any kind of pressure, whether from the immune system or medications. "Those variants may enable the virus to evade the body's immune response and also to develop resistance to therapy," Cotler says. In addition, the most common form of hepatitis C — genotype 1 — is, maddeningly, the least responsive to treatment.

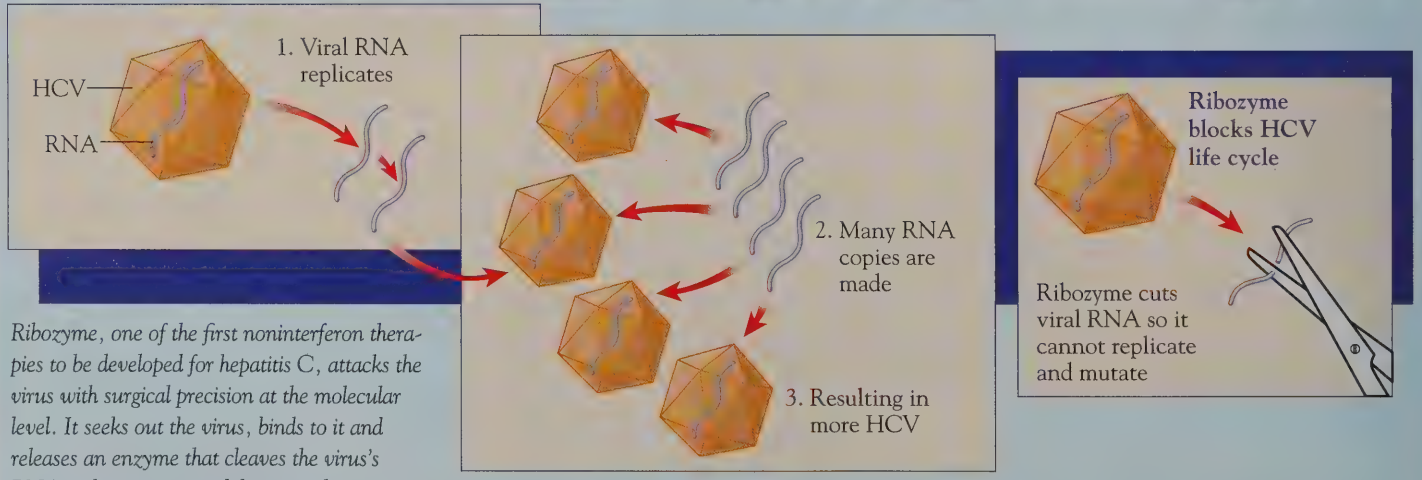
Giving interferon a boost

Adding the oral antiviral drug ribavirin to interferon therapy boosted the sustained response rate to 40 percent. And the latest treatment, a combination of a new long-acting interferon and ribavirin, has shown an even greater ability to kill the virus — plus, it's more effective against genotype 1.

Because it isn't absorbed or degraded as quickly by the body, long-acting interferon can be given once a week, rather than three times a week as with regular interferon. "The drug isn't released slowly and bit by bit, like a time capsule. It just stays in the body longer, so it puts more pressure on the virus," says clinical trial coordinator Mary Vance, RN.

And more pressure means more cures. Results from recent clinical trials of long-acting interferon and ribavirin showed an overall sustained response rate of 55 percent —

Hepatitis C virus (HCV) life cycle


HCV
RNA
1. Viral RNA replicates
2. Many RNA copies are made
3. Resulting in more HCV
Ribozyme blocks HCV life cycle
Ribozyme cuts viral RNA so it cannot replicate and mutate

Ribozyme, one of the first noninterferon therapies to be developed for hepatitis C, attacks the virus with surgical precision at the molecular level. It seeks out the virus, binds to it and releases an enzyme that cleaves the virus's RNA, taking away its ability to replicate.

Illustration by Kristen Wienandt

How you do and don't contract Hepatitis C

The hepatitis C virus is NOT airborne. It cannot be spread by:

- sneezing and coughing
- holding hands
- kissing
- sharing a bathroom
- eating food prepared by someone with HCV
- holding a child in your arms
- swimming in a pool

The virus IS in the blood of an infected person. HCV can be spread by using something with infected blood on it, such as:

- razors, nail clippers or scissors
- toothbrushes and water pics
- tattoo or body piercing needles
- illicit IV drug needles
- tampons or sanitary napkins

The virus must enter the body through the skin or mucous membrane.

40 percent for genotype 1 and 70 percent for less common genotypes 2 and 3.

Kenny, who had genotype 1, had a textbook response to the therapy. "I'd been guardedly optimistic because I knew genotype 1 doesn't respond as well as the other genotypes," he says. "But after just four weeks, my viral count was significantly reduced; it fell like a ton of bricks."

He completed his 48-week treatment course at Rush in November 2000. And because he tested virus-free at his six-month follow-up in May, his doctors say there's an excellent chance he will remain healthy. Most people who relapse do so within six months; patients showing no trace of the virus at that point have a 96 percent chance of being cured.

"It might come back, and it might not, but I'm not really worried," Kenny says. "All I know is that today is a good day. And that's enough for me."

New hope for nonresponders

For Bill Kenny, the hepatitis C nightmare is most likely over. But there are many others who don't respond to any of the interferon-based treatments.

"If you're a glass-is-half-empty kind of person, you would point out that although we can now cure many people with hepatitis C, there are many others we can't cure and will never be able to cure with interferon," says Cotler. "So it's exciting to have a new approach that may work for those who don't benefit from interferon."

That new approach, hepatitis C ribozyme, is one of the first noninterferon treatments to be developed for hepatitis C. Trials for the drug began earlier this fall at Rush and a handful of other medical centers in the United States.

Ribozyme is an injectable drug that acts like a pair of molecular scissors. The drug seeks out and attaches itself to the genetic material of the hepatitis C virus, then cuts it at a specific point that inhibits the virus's ability to replicate (see diagram on page 10). Because the region to which the ribozyme attaches is a constant among all six strains of hepatitis C, researchers hope the drug will treat all of the strains with near-equal effectiveness.

The other benefit of ribozyme is that, unlike interferon, it binds only to the hepatitis C virus, so it doesn't affect the surrounding cells and cause any serious side effects. Interferon's side effects include mild to debilitating fatigue, decreased white and red cell counts, irritability and even depression.

"The idea of developing treatments that attack at the molecular level is to kill the virus without affecting healthy cells," says Cotler. "Ribozyme targets, with almost surgical precision, an RNA sequence that is specific to hepatitis C. For that reason, it may be a good alternative for patients who can't tolerate interferon."

An ounce of prevention

For the millions of people who have hepatitis C, the development of more effective and less toxic treatments is reason to be optimistic.

And ribozyme is just the beginning of the molecular revolution. Clinical trials are expected to start soon for a group of drugs known as polymerase inhibitors, which work in a manner similar to the so-called protease inhibitors currently used to treat HIV and hepatitis B patients, by blocking the enzyme that enables the virus to replicate.

But because we are still years away from a foolproof cure, not to mention a vaccine, education and awareness are still the best tools for preventing the spread of the virus. And the best advice for surviving it is the same advice given in that public service announcement Bill Kenny heard years ago: if you are experiencing chronic fatigue and think you may have come into contact with infected blood, get tested.

"There are so many people with hepatitis C who don't know they have it," Kenny says. "But you should know that you don't have to be of questionable character to get it; it happens to us, to normal, everyday people." ■

Photography by Andrew Campbell

After being treated with a combination of a new long-lasting interferon and ribavirin at Rush last year, Bill Kenny was cured of his hepatitis C. Now he can worry about more important things, like taking his dog to the park.

the Eyes have it:

Advances in Ophthalmology

by Sean Carr

Buddy Holly. Woody Allen. Chicago's own Harry Caray. For decades, celebrities have gotten a lot of mileage out of their eyewear. The future famous, though, may have to work a little harder for their trademark looks.

"Thirty years from now, it will be very unusual to see anyone in glasses," says Thomas Deutsch, MD, chairman of the department of ophthalmology and medical director of the Rush Eye Laser Center. "More and more people are going to have less and less reason to wear glasses or contacts."

Why? Laser vision correction — just one of several innovations in ophthalmology, which also includes a more effective approach to corneal transplantation and a tiny chip that may one day help the blind to see.

Photography by Andrew Campbell

Considered experimental only a decade ago, laser vision correction is quickly becoming the solution of choice for many of the 130 million American men and women who are nearsighted, farsighted or who have astigmatism.

Nearsightedness, farsightedness and astigmatism — conditions known collectively as refractive disorders — occur when the light coming into the eye isn't properly focused on the retina, the light-sensing layer at the back of the eye, causing images to be blurred. Glasses and contact lenses, by bending the light before it enters into the eye, bring those images back into focus.

The cornea is the transparent dome that covers the eye and provides most of its focusing power. Doctors knew they could bring images into focus by reshaping the cornea itself — flattening it to correct for nearsightedness, steepening its curve to adjust for farsightedness. Such delicate surgery, though, was difficult to perform in isolated cases, let alone on a regular basis.

The first refractive procedure to gain wide acceptance was radial keratotomy. Introduced in the 1980s but rarely performed today, it involves making several precisely placed incisions around the cornea with a scalpel. When these incisions heal, the cornea flattens, correcting the patient's nearsightedness.

Laser show

Taking their cue from the computer world, doctors realized a few years later that they could remove the potential clumsiness of the scalpel from the procedure altogether.

The excimer laser, used since the mid-seventies to etch tiny patterns in microchips, is perfect for use on the eye since it does its work not with destructive heat but with a cool beam. Applied to the cornea, this beam removes layer after thin layer by breaking the chemical bonds that hold cells together.

Photography by Andrew Campbell

Thomas Deutsch, MD

Rush — which studied the first laser approved for refractive surgery — is currently testing new and improved laser approaches, one of which focuses on removing the possibility of error when patients move their eyes during laser surgery.

The LADARVision 4000 makes 100 adjustments a second during surgery, allowing the laser to move with the eye. "Once it locks in, the eye and the laser are basically one," says Jonathan Rubenstein, MD, director of refractive surgery at the Regenstein Eye Center at Rush and a principle investigator in many of the original FDA clinical trials of lasers.

The other part of the error equation is experience. The doctors with the most experience are those who have been researching lasers for years at academic medical centers. In that select company, Rush's doctors still stand apart. "We were the first — and for a long time, the only — academic department of ophthalmology in Chicago that did refractive laser surgery," Deutsch says.

Tougher problems

But perfecting laser surgery is just one research area in ophthalmology at Rush. Work is also under way to help people whose sight is almost gone or on the verge of fading.

When someone needs a corneal transplant, his or her vision is not just blurred — it's disappearing. The cornea has lost its transparency, either through an accident or a degenerative condition, and the light that makes sight possible can't get through. After a successful transplant, normal vision is restored.

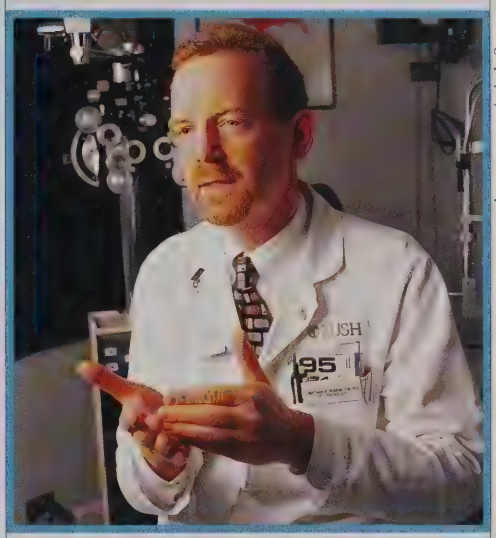
Although corneal transplantation is considered the most successful of the transplant procedures — some 45,000 are performed each year — there is an unfortunate group of patients for whom it doesn't work. In some cases the new cornea begins to fail. Sometimes, this is because the eye's ability to regenerate its protective epithelium, an ongoing process in a normal eye, has been destroyed. Instead, an opaque film covers the eye, effectively blinding the patient.

"For years," says Rubenstein, "we had to tell these people, after a couple of failed corneal transplants, 'We're sorry, but there's nothing more we can do.' Now we have something we can offer some of these patients."

That something is an improved procedure in which, along with the cornea, the surgeon also transplants several hundred epithelial stem cells. Taken from a healthy eye, these cells can serve as the source of a new, constantly regenerating epithelium. Rubenstein performs one or two such transplants each month.

A miracle's first steps

In one of the newest studies at Rush, surgeons are also offering a glimmer of hope to some blind patients. In July, Kirk Packo, MD, and John Pollack, MD, participated in a surgery to implant a tiny chip — invented by Alan Y. Chow, MD, and produced by Optobionics — into the eye of a 59-year-old man who has lost most of his vision to retinitis pigmentosa. This condition and other diseases of the retina, such as macular degeneration, affect 10 million Americans, 1 million of whom are blind.



Photography by Andrew Campbell

Jonathan Rubenstein, MD

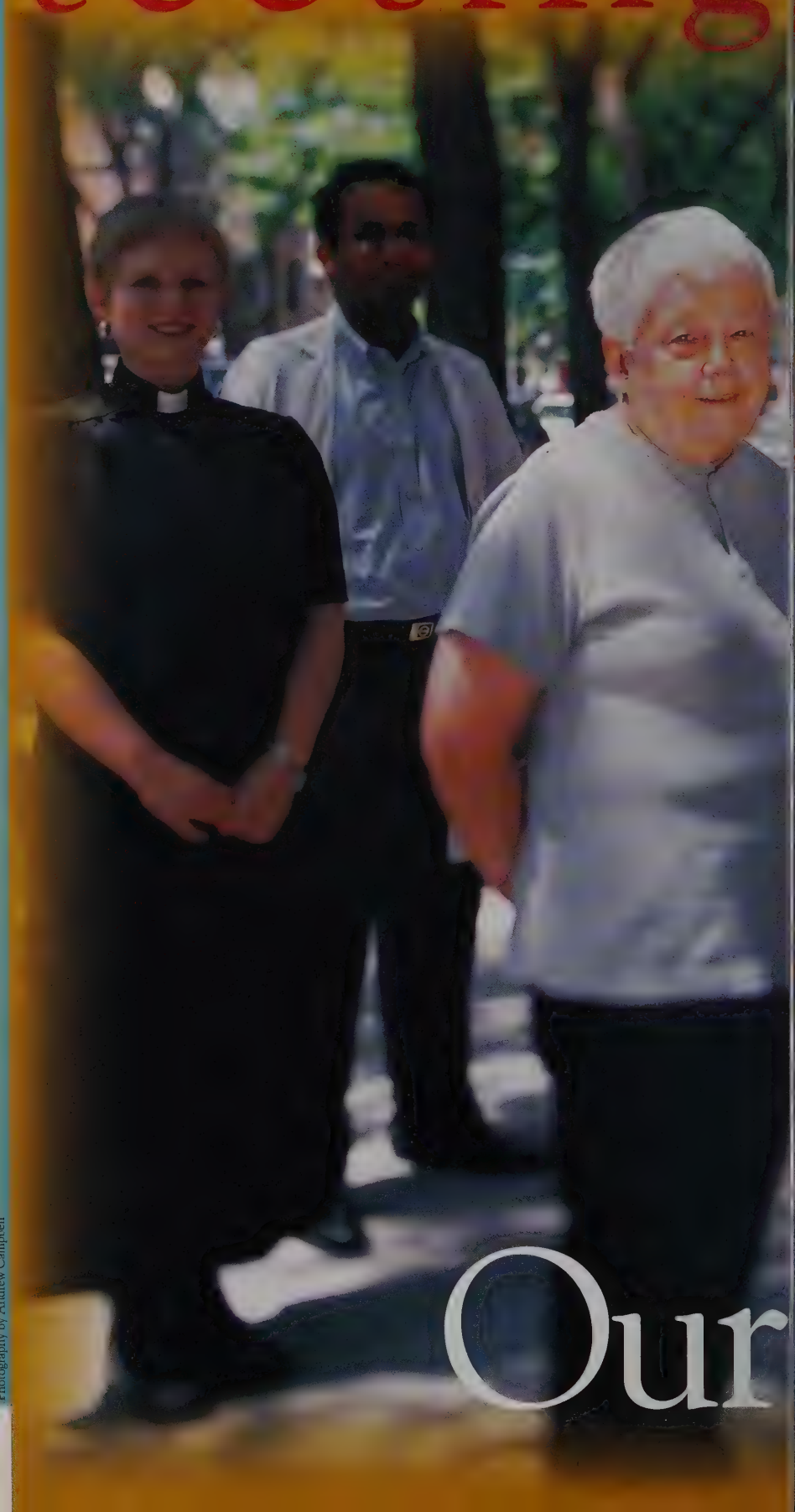
In the three-hour surgery, a chip 2 mm. in diameter and thinner than a human hair was implanted behind the man's retina. There, its 3,500 solar cells will hopefully take over for the retina's damaged light-sensing cells, reopening the electrical pathway that converts the light entering the eye into visual input in the brain — which is to say, sight.

Packo, cautioning that the current trial is only intended to ensure that the chip isn't harmful, says the patient is doing extremely well and that the chip has been shown to be electrically functioning. Their hopes for the future? "That a version of this chip will restore some functional vision, helping people with certain kinds of blindness to get around better."

Modest words that mask exciting potential. For if a world without eyeglasses is interesting to imagine, what of one in which even the blind can experience sight? ■

Protecting Our

Mistreatment of the nation's elderly is a depressingly prevalent form of domestic violence that affects as many as 2 million older adults in the United States. Rooting out elder abuse and neglect — and preventing further violence — depends on creative alliances between public health professionals and the community.



Photography by Andrew Campbell

If you suspect that an elderly person is being abused — physically, emotionally or financially — call the Illinois Department on Aging hotline: (800) 252-8966 (8:30 a.m. to 5:00 p.m. Monday through Friday) or (800) 279-0400 (evenings, weekends and holidays).

Elderly

by Marie Mahoney

In the mid-1970s, the British medical press began publishing troubling reports of a phenomenon dubbed "granny battering." Though the term itself was unfortunate, these reports shed the first glimmer of light on the problem of elder abuse — until then a largely unrecognized form of domestic violence.

It was not long before informal case studies in the United States confirmed that the problem was also common here. In the decades since then, larger, controlled studies have provided further evidence that elder abuse — an umbrella term that covers physical and sexual violence, emotional or psychological abuse, and neglecting to provide the necessities of life such as food, clothing, shelter and medical care — occurs with discouraging frequency. In fact, experts estimate that 4 to 6 percent of the nation's elderly are abused or neglected. Estimates put the number of Illinois victims of elder abuse or neglect at 75,000.

Stories of elder abuse and neglect range from the relatively innocent to the horrifying. At one end of the spectrum, there's the young woman, overwhelmed by the demands of caring for both an elderly grandmother and a new child, who sometimes forgets to administer the elderly woman's medications. Far on the other end of the spectrum, there's the 35-year-old drug addict who knocks his elderly mother against the wall and threatens further violence if she doesn't hand over her social security check to support his habit.

And financial exploitation — which factors into about half of all elder abuse cases — is rampant, says Martin J. Gorbien, MD, director of geriatric medicine at Rush. "Here's a typical scenario. A woman, under the guise of 'helping,' slips a piece of paper under her grandmother's nose, and says, 'Sign this, grandma, it'll let me pick up your medicine for you.' And voilà — she's just signed over ownership of her home."

Research suggests that the number of unreported cases of elder abuse outnumber officially reported cases by a factor of around five to one. "Given the gap between the number of cases of elder abuse and the

Ensuring the safety of America's elderly is the responsibility of the entire community, including clergy, health care professionals, friends, family and neighbors.

Photography by Andrew Campbell

In addition to being director of the section of geriatric medicine at Rush, Martin J. Gorbien, MD — shown here with a patient — is director of the Johnston R. Bowman Health Center for the Elderly, a facility that provides outpatient recovery and rehabilitation services as well as residential apartments for seniors. The center is celebrating its 25th anniversary this year.

Recognizing elder abuse is not always a straightforward matter. One of the goals of the Illinois-Missouri partnership is to teach health care professionals how to differentiate between physical symptoms that signal abuse and those that result from common problems associated with aging.

number reported," Gorbien says, "we clearly need to do a better job of educating the public and the media about this issue."

A special responsibility

One way Gorbien and his colleagues in geriatric medicine are doing just that is through a partnership with St. Louis University to raise awareness of elder abuse among health professionals who care for elderly people in Illinois and its western neighbor. The Illinois-Missouri Gateway Geriatric Education Center is one of 34 such programs funded by the U.S. Department of Health and Human Services. Ultimately, the program will expand its efforts to reach more than 20 different health care disciplines.

"In many cases, physicians and other health care professionals are the only people outside the family who see an older adult on a regular basis," Gorbien says. "This grant will help us teach these professionals how to recognize signs of elder abuse, how to act on their responsibility to report it and how to intervene to stop it."

But recognizing elder abuse is not always a straightforward matter. One of the goals of the Illinois-Missouri partnership is to teach health care professionals how to differentiate between physical symptoms that signal abuse and those that result from common problems associated with aging. "If a baby has a broken bone, it is likely to mean abuse," Gorbien says. "It is harder to interpret similar physical findings with the elderly. Let's be clear — every pressure ulcer and every fractured hip does not represent elder abuse."

There are, however, a number of factors that heighten the risk of elder abuse or neglect, Gorbien says. "Health professionals should be particularly alert to situations where an elderly person's care needs exceed — or threaten to exceed — the family's ability to provide adequate support," he says. In many cases, the abuser is an adult child who suffers from mental illness or who is financially dependent on the elderly person. Other red flags include a family history of domestic violence and a history of alcohol or drug abuse, either in the elderly person or a family member.

"The most important thing a physician can do to prevent elder abuse — and to help stop it when it does occur — is to form a trusting doctor-patient relationship and a therapeutic, accessible alliance with

Facts About Elder Abuse

- A close family member is the perpetrator in the vast majority — close to 90 percent — of elder abuse and neglect cases. In more than half the cases, the abuser is an adult child.
- A recent congressional study reported that nearly one-third of US nursing homes violated "abuse prevention standards," including failure to conduct proper background checks on staff and failure to investigate allegations of abuse and neglect.
- The most vulnerable elderly — those over the age of 80 — suffer abuse at a disproportionately high rate. Around 20 percent of the nation's elderly are 80 years of age or older. Yet they account for about one-half of all financial abuse and neglect cases, 44 percent of the incidence of physical abuse and 41 percent of psychological abuse cases.
- Alcohol or drugs play a role in one out of four cases of elder abuse.
- Three out of four victims of elder abuse are women.
- Elder abuse shortens life expectancy. Recent research suggests that senior citizens who have been abused tend to die earlier than those who are not abused, even if they don't suffer from a chronic condition or life-threatening disease.

Twelve Steps for Caregivers

by Carol J. Farran, DNSc, RN and Eleanore Keane-Hagerty, MA

Although I cannot control the disease process, I need to remember I can control many aspects of how it affects me and my relative. I need to:

- take care of myself so that I can continue doing the things that are most important.
- simplify my lifestyle so that my time and energy are available for things that are really important at this time.
- cultivate the gift of allowing others to help me, because caring for my relative is too big a job to be done by one person.
- take one day at a time rather than worry about what may or may not happen in the future.
- structure my day, because a consistent schedule makes life easier for me and my relative.
- have a sense of humor, because laughter helps to put things in a more positive perspective.
- remember that my relative is not being "difficult" on purpose, rather that his/her behavior and emotions are distorted by the illness.
- focus on and enjoy what my relative can still do rather than constantly lament over what is gone.
- increasingly depend upon other relationships for love and support.
- frequently remind myself that I am doing the best that I can at this very moment.
- draw upon the Higher Power, which I believe is available to me.

Reprinted from The American Journal of Alzheimer's Care and Related Disorders & Research, *November/December, 1989, 4(6), 38-41.*

the family," Gorbien says. This is particularly crucial when the elderly person suffers from Alzheimer's or a related form of dementia, which severely tasks the emotional resources of even the strongest families. "It is important to acknowledge the support caregivers provide and to give them permission to meet their own needs," says Carol Farran, DNSc, RN, a Rush researcher who studies how family caregivers of people with dementia are affected psychologically and physiologically. She is currently conducting a support program that teaches family caregivers some of the skills they need to care for a loved one with Alzheimer's disease and provides information about community resources — such as respite care, adult day care and meals on wheels — that can help relieve their burden.

Everyone's problem

Rush is also tackling the problem by helping to bridge the gap between health care professionals and other members of the community who have the well-being of the elderly very much in mind.

Gorbien is part of a multidisciplinary team that meets once a month on Chicago's south side at the Calumet Center of Metropolitan Family Services. For six years, he has been the physician representative to this so-called "M" team, one of 16 such teams in Cook County contracted by the state to evaluate challenging elder abuse cases. The "M" teams include representatives from a wide range of professions whose work brings them into frequent contact with the elderly — social workers, mental health professionals, nurses and physicians, as well as elder law attorneys, clergy, bankers and law enforcement professionals. Gorbien's Rush colleague Anthony Perry, MD, serves a similar role on Metropolitan Family Services' central west and southwest multidisciplinary team, which covers neighborhoods near Rush.

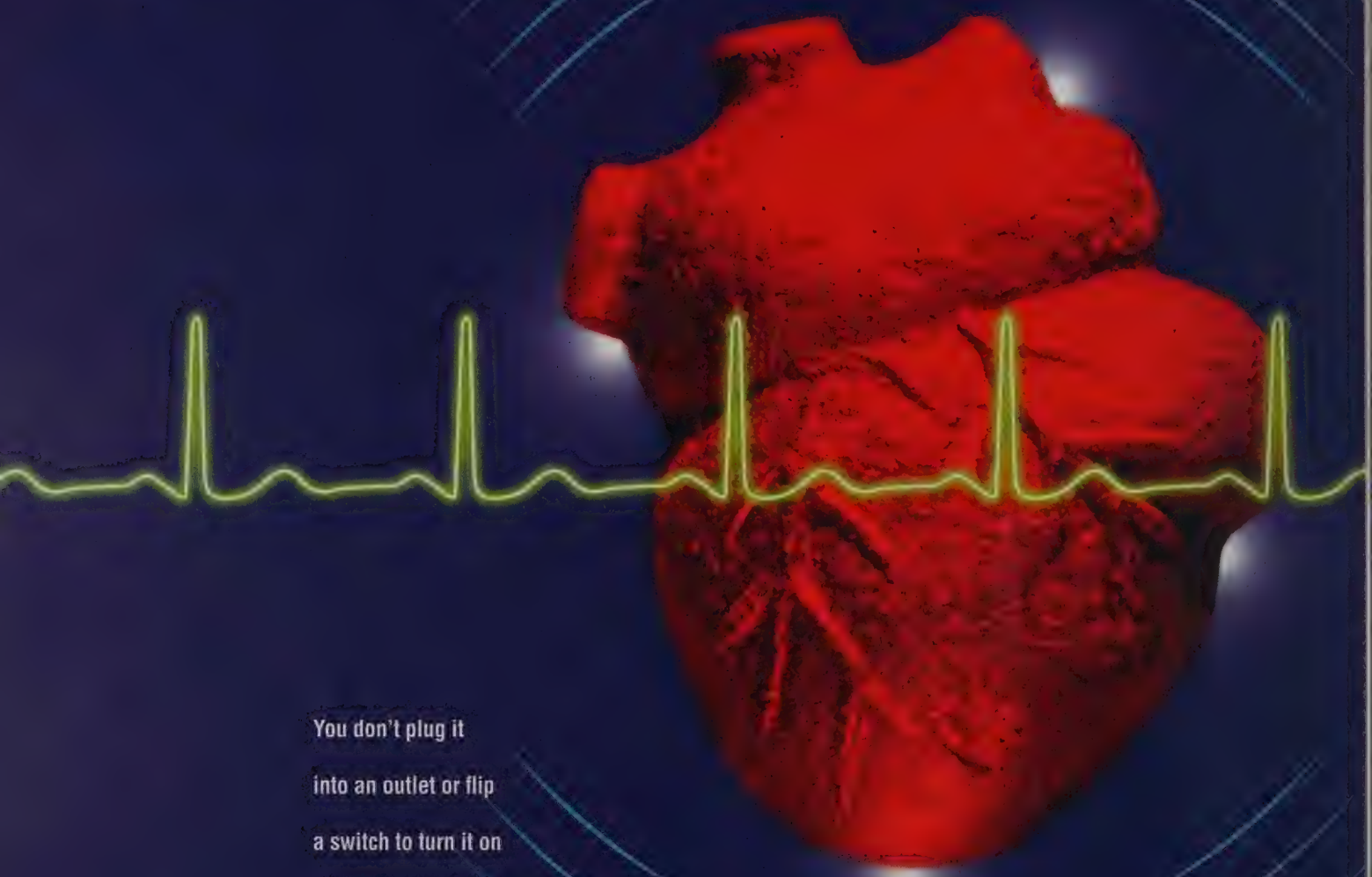
"The idea," says Gorbien, "is for each profession to share its perspective and to use the expertise and training of everyone at the table to pull together a wide range of alternative solutions when answers are neither obvious nor simple." These solutions include helping the abused recover stolen property, as well as working with lawmakers to bring to justice the most heinous offenders. There's also counseling and support for abusers, who often can benefit from interventions such as anger and stress management. Sometimes families simply need help navigating the "system" — including figuring out how to get the equipment and supplies necessary to appropriately care for the elderly person and making connections with local agencies.

Gorbien acknowledges that people who work with the elderly often tread a fine line between helping and violating the independence of an elderly person. But Gorbien believes it is better to intervene than to pay the costs of doing nothing. "Many elderly people are isolated and cannot make themselves heard," he says. "It is the responsibility of everyone in the community, not just health care professionals, to give them a voice." ■

Photography by Andrew Campbell

Carol Farran, DNSc, RN (left), counsels family caregivers on the best ways to care for loved ones with dementia.

The Electric Heart



You don't plug it into an outlet or flip a switch to turn it on and off, and it's not regulated by ComEd. But just like your TV set, computer and microwave oven, your heart is powered by electricity.

by Judy Grossman

A **heartbeat** that's too fast or too slow can affect blood flow to the body, resulting in problems that range from disruptive to deadly.

For the heart to function properly, its four chambers must beat in sync. And controlling that beat is the job of a small cluster of cells that serve as the heart's "natural pacemaker," sending electrical signals across the chambers to make them contract. As long as the signals transmit normally, the heart beats at a regular pace.

It's important for the heart to beat regularly because it is responsible for pumping about 2,000 gallons of blood through the body each day. Without a constant supply of blood, the brain and organs would be starved of oxygen and die.

But sometimes the orderly conduction of electrical signals gets disrupted, or the electrical pathways become blocked, causing an arrhythmia, or abnormal heartbeat — just as disruption in the flow of electricity to a light bulb causes it to flicker. A heartbeat that's too fast or too slow can affect blood flow to the body, resulting in problems that range from disruptive — such as dizziness, fatigue and fainting spells — to deadly. More than four million Americans suffer from some sort of arrhythmia.

A number of things can cause the heart's electrical system to short circuit — including inborn heart defects — though most arrhythmias are caused by damage to the heart from either a heart attack or heart failure. Any time the heart muscle is damaged, it heals as scar tissue, which can make the affected area unstable and cause the chambers to contract abnormally.

Stabilizing the heart's rhythm — and keeping it stable — is the key to relieving symptoms and, in the case of the most serious arrhythmias, preventing sudden death.

Shock to the heart

Because there are many different kinds of arrhythmias, there are also many treatments, from medications to procedures to devices. Rush, which in the 1990s helped pave the way for several new approaches to earn FDA approval, now offers a full array of treatment options for arrhythmias and has expertise in diagnosing and treating two potentially deadly arrhythmias: ventricular tachycardia and ventricular fibrillation.

Ventricular tachycardia, an overly rapid heart rate that starts in the pumping chambers, can be fatal if not treated promptly. And if a ventricular tachycardia becomes unstable and irregular, a condition called ventricular fibrillation occurs. The heart starts beating in a disorganized manner — it quivers — and, as a result, little if any blood gets pumped and the body is quickly starved of oxygen. Ventricular fibrillation can happen without warning, and it causes collapse and sudden death unless help is provided immediately.

If treated right away, however, both ventricular tachycardia and ventricular fibrillation can be converted into normal rhythm with an electrical shock — and one of the newest treatments for arrhythmias, an implantable version of the defibrillators carried by paramedics, does just that. The implantable cardioverter defibrillator, or ICD, helps patients who have a history of heart damage and are at serious risk for developing irregular heart rhythms that, if not interrupted, could lead to sudden death.

The most famous ICD recipient, Vice President Dick Cheney, had his implanted in July 2001. With his history of heart damage — he's had four heart attacks — doctors deemed the vice president a serious risk for sudden death from an arrhythmia. "You don't die from the dead heart muscle, you die when the rhythm becomes unstable and causes the heart to beat chaotically," says cardiologist John Barron, MD, PhD, director of the cardiac stress testing laboratory at Rush.

Having an implantable defibrillator is like having a paramedic with you 24 hours a day. It monitors the heart continuously, and if it detects a dangerously rapid and erratic rhythm, it instantly delivers a tiny jolt of elec-

Photography by Bill Richert

Sergio Pinski, MD, director of the Rush Arrhythmia Device Program (left), and Alain Heroux, MD, vice medical director of the Rush Heart Failure and Cardiac Transplant Program, use cutting-edge technology to normalize and resynchronize the heart's rhythm.

Photography by Andrew Campbell

Similar to an ordinary exercise stress test, the T-wave alternans test is done on a treadmill. During the test, Joe Maxwell, manager of clinical services for the Rush stress lab, and Sandra Ritchie, RN, monitor the patient's heart rate to identify any rhythm disturbances that could be predictors of sudden cardiac death.

tricity to disrupt the abnormal rhythm and stabilize the heart beat.

"If defibrillation is applied promptly, you have a very good chance of surviving with no damage," says Sergio Pinski, MD, director of the Rush Arrhythmia Device Program.

T-wave of the future

Tragically, 40 percent of patients with congestive heart failure and one-third of all heart attack patients die suddenly as a result of lethal arrhythmias. But many of those deaths could be prevented by recognizing a person's potential for sudden cardiac death and taking preemptive treatment measures, as Cheney's doctors did.

The standard tool for diagnosing potentially lethal arrhythmias is an electrocardiogram, or EKG. The EKG, however, is not the best predictor because it can't distinguish between abnormal beats that may cause arrhythmias and those that are harmless.

Far more accurate is the electrophysiological, or EP, study, in which doctors place a catheter into the patient's heart and induce a lethal arrhythmia by changing the heart's pacing. But while it's not dangerous — the arrhythmia is induced in a controlled setting — the EP study is highly invasive.

A new test, called T-wave alternans, is more sensitive than the EKG and a lot less invasive than an EP study, since it's incorporated into a standard exercise stress test. Rush is the first medical center in Chicago to offer this new test, which doctors hope will be able to detect the most minute changes in the heart's electrical activity and distinguish between variances that are harmless and those that forewarn lethal arrhythmias.

The T-wave test will help cardiologists determine how aggressively they should treat patients who have a history of heart disease or who have just suffered a heart attack. "We can find out which of these patients may develop a lethal arrhythmia, then devise an appropriate treatment strategy for those who are at risk," Barron says.

Heart Burn

Defibrillation effectively stabilizes the heart's rhythm. Another approach is catheter ablation, an outpatient procedure that uses heat delivered through wires placed inside the heart to burn away defective cells that create abnormal rhythms. Among the candidates for this procedure are patients with certain types of abnormally fast heartbeats, and those who cannot tolerate standard drug therapies.

To perform the procedure, Pinski relies on a new heart mapping and ablation device that is not yet widely available. The device, known as the Carto system, is the latest advancement in a diagnostic and therapeutic procedure known as electrophysiology (EP) mapping. The Carto EP mapping system "maps" out the heart's electrical conduction system, provokes an abnormal heart rhythm when necessary for diagnostic purposes, tests the effects of heart medications and guides catheter ablation.

The system relies on magnets rather than X-rays — the traditional method — to pinpoint the damaged areas of the heart and guide catheter ablation, making it safer for patients by avoiding X-ray exposure. In addition, it significantly decreases the time needed to perform an ablation because it determines the location of the damage faster and more precisely than an X-ray based system.

"Ablation therapy can quite often cure the patient's rhythm disturbances," says Pinski. "It's a major advancement in the treatment of many arrhythmias."

Setting the pace

Another huge breakthrough — considered by cardiology experts as one of the top advances

American Heart Association Statistics

- About 550,000 new cases of congestive heart failure occur each year.
- Ten in 1,000 people over the age of 75 have congestive heart failure.
- About 22 percent of male and 46 percent of female heart attack victims will be disabled with heart failure within six years.
- The five-year mortality rate for heart failure is about 50 percent.
- After congestive heart failure is diagnosed, survival is poorer in men than in women. But fewer than 15 percent of women survive more than 8 to 12 years, and their one-year mortality rate is higher, with 1 in 5 dying.
- In people diagnosed with congestive heart failure, sudden cardiac death occurs at 6 to 9 times the rate of the general population.
- While ventricular fibrillation is listed as the cause of relatively few deaths, the overwhelming number of sudden cardiac deaths from coronary heart disease (which are estimated at about 220,000 per year) are thought to be from ventricular fibrillation.

Courtesy of the American Heart Association (1998).

"It saved my life," says heart patient Gerald Virgo of the device in his chest. "Now I can do all the things I couldn't do before — and then some."

Photography by Andrew Campbell

Gerald Virgo, shown here with grandson Logan, has renewed energy for life after receiving his biventricular pacemaker-ICD. The device synchronizes his heart's pumping chambers and can disrupt any potentially lethal arrhythmias.

in heart care in recent years — is the biventricular pacemaker, which doctors use to treat patients with heart failure.

Heart failure occurs when the heart cannot pump enough blood to meet the body's needs. As heart failure advances, the heart eventually becomes enlarged and misshapen. This deterioration disrupts the normal electrical conduction and causes the ventricles to beat one at a time, rather than in unison. The resulting symptoms — shortness of breath, fatigue and weakness — can severely limit daily activity.

That's what happened to Gerald Virgo. The 67-year-old retiree had suffered several heart attacks, and the damage weakened his heart's pumping action, ultimately leading to heart failure. By the time he came to Rush in July 2000, Virgo had grown so short of breath that he had to rest between showering and shaving.

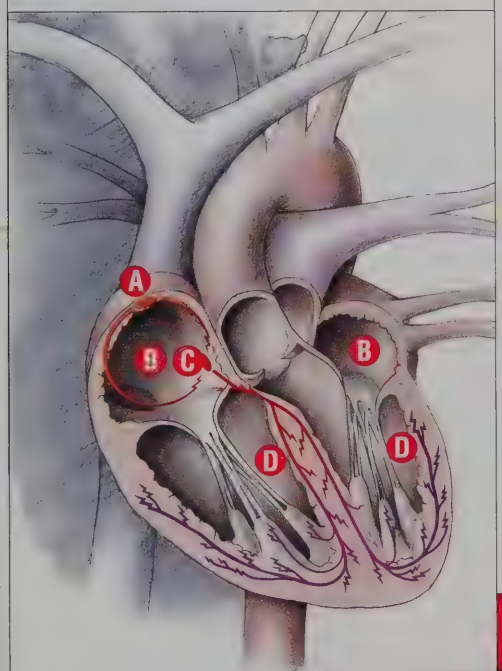


Illustration by Kristen Wienandt

The electrical signals that cause the heart to beat are produced by a small mass of specialized cells (A), located at the top of the right atrium. These signals spread throughout the atria (B) and to the atrioventricular node (C), then travel down to the ventricles (D). This exact route must be followed for the heart to pump properly.

Relief came in the form of a biventricular pacemaker, which stimulates both the left and right ventricles so that they contract simultaneously. This increases the strength of the pumping action and enables the heart to more effectively supply blood throughout the body. "The theory is that if you resynchronize the ventricles and maximize cardiac output, the patient will feel better and will be able to resume their activities," says Alain Heroux, MD, vice medical director of the Rush Heart Failure and Cardiac Transplant Program.

And Virgo's biventricular pacemaker had a bonus: a built-in defibrillator. This dual-functioning device is ideal for patients with heart failure who are also at risk for sudden death: While the pacemaker provides continuous synchronization and monitors the heart rate, the ICD waits in the wings in case a dangerous arrhythmia occurs.

Rush is one of a handful of medical centers taking part in two national studies of biventricular pacing for heart failure patients, and Virgo is part of one of the first controlled studies to evaluate the effects of resynchronizing the heart in terms of both quality of life and longevity. "We do feel that resynchronization improves quality of life," says Pinski, who is principal investigator of both trials at Rush. "What we don't know is whether it increases the survival rate; that's one of the things we hope to determine."

Rush cardiologists estimate that one-third of patients with severe heart failure could benefit from the biventricular pacemaker. Virgo certainly has. Today, he can lift weights, play golf and babysit for his grandkids. "It saved my life," he says of the device in his chest. "Now I can do all the things I couldn't do before — and then some."

The beat goes on

With more people surviving heart attacks, as Gerald Virgo and Vice President Cheney did, and with the average lifespan increasing, there are going to be even more instances of sudden cardiac death and heart failure in the future. Already, heart failure is the fastest growing cause of hospitalization in the United States, with 400,000 new cases annually.

"For that reason, we've been very aggressive in trying to find new ways of treating patients," says Heroux. "The good news is that we now have all of these tools that have the potential to make their lives better and possibly even improve their chance of survival." ■

Leading Causes of Death in the United States (by age group)

	0-14	15-24	25-44	45-64	65-74	75+	Total
Cardiovascular disease	2	4	2	2	1	1	1
Cancer	3	3	3	1	2	2	2
Chronic obstructive pulmonary disease	7	5	8	5	3	4	3
Accidents	1	1	1	3	6	6	4
Pneumonia and influenza	4	6	7	8	5	3	5

Courtesy of the American Heart Association

Does St. John's Wort belong in the classroom?

While the number of people self-prescribing herbal therapies continues to rise, few health care providers have the educational background to understand the implications of their use. A Rush expert discusses the potential pitfalls of herbal products and other complementary and alternative therapies and the need to educate health care professionals.

Interview by Anne O'Reilly

The number of Americans using complementary and alternative (CAM) therapies, such as herbal products, acupuncture and guided imagery, increased from about 33 percent in 1990 to more than 42 percent in 1997, according to the National Center for Complementary and Alternative Medicine. While many of these treatments used in conjunction with conventional medicine can be helpful, some, particularly those used without the supervision of a health care provider, have proven to be dangerous. In fact, an article in the Journal of the American Medical Association *described the potential for commonly used herbal therapies to cause serious problems in patients undergoing surgery.*

Despite widespread use of herbal medicines, there has been little or no formal training available for health care providers.

Rush is working to fill the information gap – starting with its nursing students. To teach nurses about CAM therapies, Rush's College of Nursing has received a five-year, $1.2 million grant from the National Institutes of Health/National Center for Complementary and Alternative Medicine. Led by Janice Zeller, PhD, RN, the grant will help Rush build a program that will bring information about CAM therapies into the undergraduate and graduate nursing curricula, as well as develop continuing education courses for nursing faculty and practicing nurses. The College of Nursing was among the first five health education programs in the nation to receive such funding.

RushRecord *writer Anne O'Reilly recently sat down with Zeller, a professor in the department of adult health nursing, associate professor in the department of immunology and microbiology, and director of the complementary and alternative therapies education program at Rush, to discuss her views on complementary and alternative treatments.*

"Walk into a Walgreens or an Osco and you'll see why we're creating a program focused on integrating complementary therapies into the nursing curriculum. Herbal remedies are everywhere. While this is only one of many complementary or alternative (CAM) therapy, it's a sign of the nation's growing interest in this field. The horse is out of the barn, so to speak, and it's been pulled out of the barn by consumers.

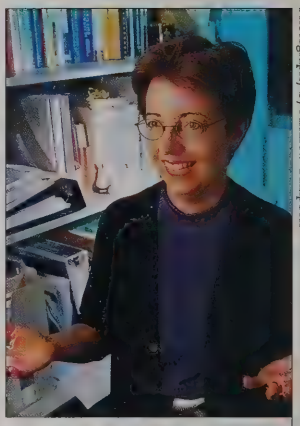
For example, complementary therapies are particularly popular among people who maintain a holistic orientation to health, meaning a belief that body, mind and spirit are important in health and illness. Others who embrace CAM therapies come from cultures that have not adopted the Western medical model.

While we can't ignore the strong belief systems and cultural traditions that are often associated with herbal therapies use, the downside of using them are the many unknowns. For example, there is little information available about how they interact with conventional drugs. However, we do know that some herbal products can cause bleeding or other side effects when used in combination with Western pharmaceutical therapies.

Many people believe that, because herbs are natural products, they don't have any adverse effects. However, the purity of these products is suspect. Some manufacturers' herbal products have been found to contain toxins and metallic elements that could be detrimental to patients.

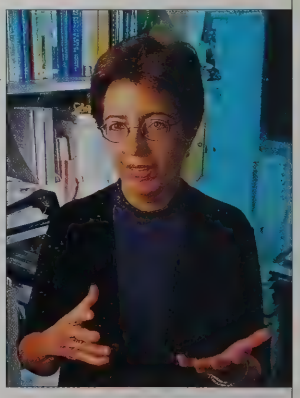
At this point, many herbal products have not been sufficiently tested or regulated, and since they don't make specific health claims, herbal products are outside the realm of the Food and Drug Administration. Another agency needs to step in to regulate this growing industry.

Until that happens, however, health care providers and nurses in particular need to educate themselves about the dangers and benefits of all CAM therapies — and then they need to help educate the public. By bringing CAM therapies into the mainstream undergraduate and graduate nursing curricula, Rush wants to prepare nurses to be able to find accurate information on CAM therapies and to effectively interview patients to discover if they are using alternative therapies. Also, Rush is emphasizing that nurses understand the importance of respecting and understanding the cultural traditions on which CAM therapies are based.



Photography by Andrew Campbell

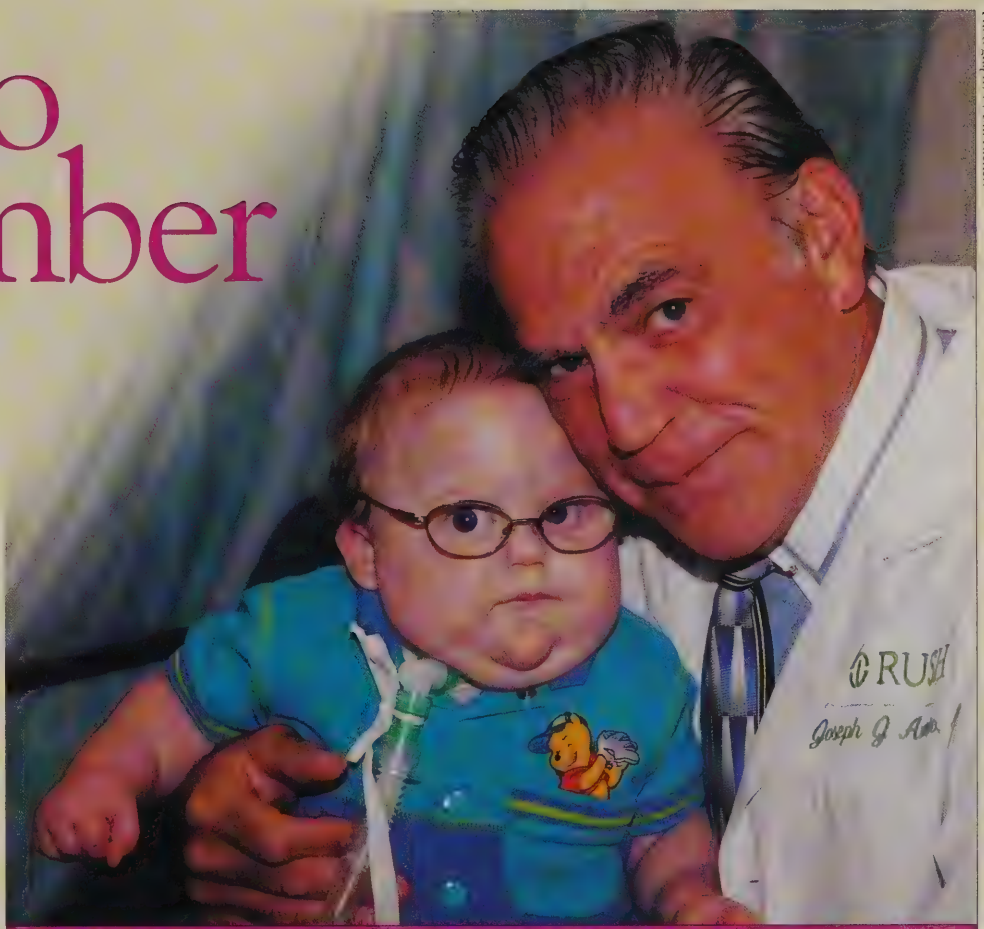
Janice Zeller, PhD, RN



In our program at Rush, we want to impress on students that we're not teaching them a whole new bag of tricks that they can use with their patients. Rather, we are teaching them a new way of interacting with patients — the goal being to treat patients in a holistic manner, taking into consideration what we know about mind, body and spirit connections." ■

One to Remember

■ *by Sean Carr*



Photography by Bill Richert

Pediatric cardiothoracic surgeon Joseph Amato, MD, visits with Tyler Todd in the Rush pediatric intensive care unit. Amato has performed the corrective surgery for ectopia cordis on three infants, including Tyler.

The front page of the *Chicago Sun-Times*. A nice article in the *Tribune*. Stories on all of the local news stations. That's all icing on his first birthday cake as far as Tyler Todd's family is concerned. They're just glad to have their birthday boy with them.

On Aug. 16, 2000, Tyler was born at Rush with a rare condition known as ectopia cordis: his heart, while beating, was outside of his chest. Last month, in the company of family and the Rush Children's Hospital staff who have cared for him over the last year, he celebrated his first birthday.

It was a celebration that was very much in doubt even before Tyler was born. His mother, Chandra Todd, of Hobart, Ind., learned about the danger her son was in during an ultrasound in the fourth month of her pregnancy. The local doctors didn't hold out much hope, since previously only six babies had lived through the corrective surgery for ectopia cordis. Chandra was told her son had just a 1 percent chance of surviving.

Photography by Katherine Smedra

Chandra Todd, shown here with her son Tyler, was told that her son had just a 1 percent chance of survival.

But then an Internet search turned up Joseph Amato, MD, Rush's director of pediatric cardiothoracic surgery, who had already operated on two other children born with ectopia cordis. And shortly after Tyler was delivered by planned cesarean section last August, Amato, with the help of plastic surgeon Sami Bittar, MD, placed the infant's heart back inside his chest during a delicate, four-hour procedure.

"He's a survivor," Amato says of his patient, who today is on minimal ventilator support and who, because he was born without a breastbone, wears a protective vest over his chest. Tyler also wears eyeglasses because of a minor brain injury that was likely caused by additional defects in his heart. Those defects were repaired in a second surgery last April.

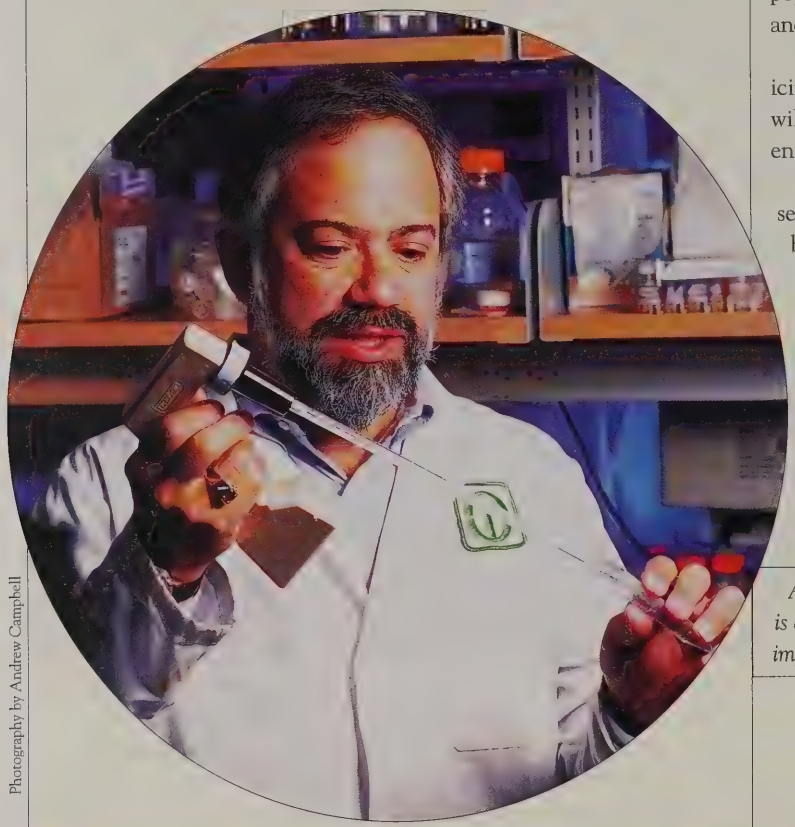
Tyler still has some tough times ahead. Down the road, he will need two more surgeries on his heart, and doctors will also have to build a breastbone for Tyler shortly after he turns six.

For now, though, the family can relish the milestone they've already achieved. And, along with those *Sun-Times* and *Tribune* clippings, they can add a few more memories to the photo album, including Tyler enjoying his Winnie the Pooh cake in the time-tested manner of one-year-old gourmands everywhere — by smearing it all over his face. ■

Rush to study HIV in women

Once far more prevalent in men, HIV is now the fifth leading cause of death among women between the ages of 25 and 44 — and the number of infected women continues to rise each year.

As part of an effort to better understand how HIV affects adolescent and adult women, Rush was recently chosen as one of three sites for the Women's HIV Pathogenesis Program, a five-year research program. The study is being funded by the National Institute of Child Health and Human Development. Funding will total approximately $1 million per year.



Photography by Andrew Campbell

Alan Landay, PhD, professor of immunology/microbiology and medicine, is evaluating the biological factors unique to women that could have an impact on how women become infected with HIV and transmit it to others.

Each site will conduct research to identify biological factors that are unique to women. Such factors could have an impact on how women become infected with the virus and transmit it to others, how the disease progresses in women after infection and how the disease affects women differently than it does men. The research will involve various populations of women, including minorities, lesbians, substance abusers and those who are approaching or experiencing menopause.

Alan Landay, PhD, professor of immunology/microbiology and medicine, is principal investigator of the Rush arm of the project, which will focus on how HIV infection influences and is influenced by the environment of the female genital tract.

Landay and his Rush colleagues — collaborating with researchers at several other Chicago-area hospitals — will be studying the effects of bacterial vaginosis, a common type of vaginal infection, on HIV in the female genital tract and whether substances in cervical secretions may increase susceptibility to HIV. They will also investigate the female genital tract's immune responses to HIV and how these responses can be boosted.

"Our hope," says Landay, "is that our findings will help us develop new tools and therapies to improve the way we care for women with HIV."

— by Judy Grossman

Starving tumors of their blood supply

If a plant is not watered regularly, it will eventually dry up and die. The same is true for breast cancer tumors; if they don't have blood vessels to feed them, they cannot grow and thrive.

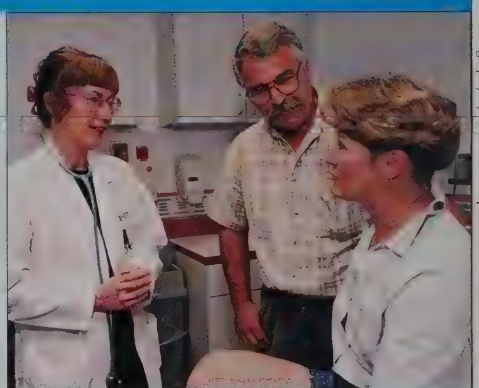
That simple premise has led breast cancer researchers at Rush to test an approach to treating cancer called antivascular endothelial growth factor, or anti-VEGF. Anti-VEGF is an angiogenesis inhibitor, meaning it specifically halts new blood vessel growth and starves a tumor by cutting off its blood supply.

"If a tumor develops but has no blood supply, it will typically only grow to the size of a small pea," explains Melody Cobleigh, MD, director of the Comprehensive Breast Center at Rush and lead investigator in the trial.

If left untreated, however, the tumor eventually gains the ability to produce proteins called angiogenic growth factors. By releasing these growth factors into surrounding tissues, where they stimulate new blood vessels, the tumor can feed itself — and rapidly expand in size.

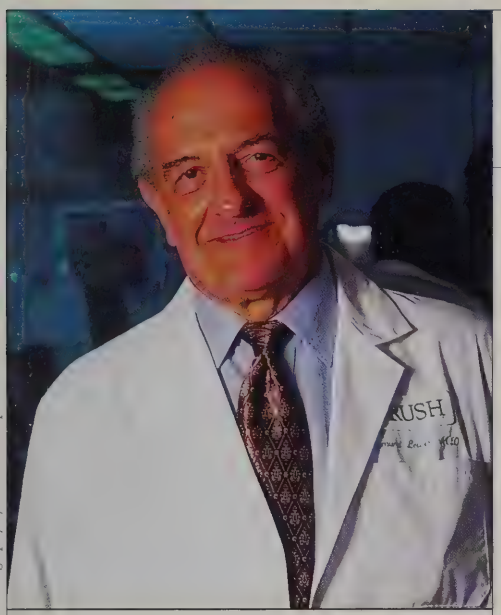
Anti-VEGF has been studied in women with breast cancer whose condition worsened after chemotherapy, and those early studies yielded promising results. The current study will determine whether combining anti-VEGF therapy with chemotherapy will produce a better result than chemotherapy alone. The hope is that anti-VEGF therapy will take away the tumor's sustenance, making it easier for the chemotherapy to destroy it.

— by Shari Kravitz



Photography by Andrew Campbell

Melody Cobleigh, MD (left), director of the Comprehensive Breast Center, is studying a drug designed to stop blood flow to tumors.



Photography by Andrew Campbell

Edmund J. Lewis, MD, director of nephrology, presented his findings on the drug irbesartan at a meeting of the American Society of Hypertension.

New hope for prevention of kidney disease

For people with high blood pressure and Type 2 diabetes — or adult onset diabetes — kidney disease can be a major problem. In fact, diabetes is the single leading cause of kidney failure in the United States today.

But now, there's new hope — and it comes in the form of an old ally, the blood pressure drug irbesartan.

In the September 20, 2001, edition of *The New England Journal of Medicine*, Edmund J. Lewis, MD, director of nephrology at Rush, presented the results of a five-year international study of irbesartan and Type 2 diabetes. Dr. Lewis, lead investigator of the trial, had previous success using the angiotensin-converting enzyme inhibitor known as captopril to treat kidney disease in patients with Type 1 diabetes — a condition that occurs in young adults and in which the body produces no insulin.

In his recent study, Dr. Lewis found that irbesartan prevented the progression of kidney disease or death by 20 percent when compared with a control group and by 23 percent when compared with a group taking the calcium channel blocker amlodipine. Irbesartan also reduced the need for transplantation or dialysis by 30 percent compared with a placebo group and slowed the progression to end-stage renal disease by 37 percent compared with those taking amlodipine. Blood pressure was controlled similarly in all three treatment groups, indicating that irbesartan specifically protected the kidney.

"Since irbesartan can prevent or delay the progression of kidney disease, dialysis or kidney transplantation," says Dr. Lewis, "treating patients with this therapy can save lives and improve quality of life." *— by Shari Kravitz*

Rush researchers focus on back pain

One in five Americans suffer from back pain. While rest, medication and physical therapy can often provide relief, some low back pain sufferers eventually need to undergo surgery. A new outpatient procedure offered at Rush, though, may provide relief without the lengthy recovery time and hospital stay of conventional back surgery.

Low back pain is sometimes caused by cracks or fissures in the invertebral discs — cartilage spacers found between the bodies of the vertebrae. Intradiscal electrothermal therapy, or SpineCATH IDET, a new minimally invasive surgery, uses heat to treat these cracks.

During this procedure, physicians use a needle to access the degenerated disc, and the SpineCath catheter is passed through the needle and heated. The heat causes the collagen fibers of the disc wall to thicken and harden, resulting in a more stable disc and a desensitization of nearby pain sensors.

"Thankfully, some patients respond to medications or therapeutic exercise, but others experience severe disc degeneration as a result of age or injury to the back," says Howard An, MD, an orthopedic surgeon at Rush. This new therapy may provide relief for those who have unsuccessfully tried conventional treatment for their chronic lower back pain."

An stresses that surgery is not a first option for most patients with low back pain and that only those patients who have pain associated with their spinal discs, as well as those who have responded to nonsurgical therapies, are good candidates for electrothermal therapy.

For those who have already undergone surgery, though, pain can persist. Deciding what to do next is a difficult decision for both the doctor and the patient. To help determine the best next step in these situations, Rush is conducting a study comparing the outcomes of second surgeries and spinal cord stimulation in patients with unresolved back pain after an initial operation.

"For the first time, we are undertaking research of sufficient scope to predict which patients are most likely to benefit from additional surgery and which patients are better candidates for spinal cord stimulation," said Gunnar Andersson, MD, PhD, chairman of the department of orthopedic surgery at Rush. "This landmark study promises to yield the data we need to make the best treatment recommendations for patients."

— by Patrick Kelly

Low back pain is sometimes caused by cracks or fissures in the intervertebral discs, which are located between the bodies of the vertebrae.

Illustration by Kristen Wienandt

Rush opens breast imaging center

Mammography visits are, by their very nature, fraught with anxiety and uncertainty. To make matters worse, there is often a significant lag time between scheduling an appointment and actually seeing a radiologist. And when patients finally do get inside the doors, long waits in crowded rooms can lead to more tension and frustration.

The recently opened Rush Breast Imaging Center hopes to change all of that. With the welcome addition of five new radiologists, an office layout aimed at creating a more relaxed and orderly environment, and state-of-the-art equipment, the center's goal is to provide superior imaging services as efficiently as possible.

Four of the "new" radiologists — Gene Solmos, MD, Anne Cardwell, MD, Lisa Stempel, MD, and Peter Jokich, MD, the recently appointed director of Rush's new section of breast imaging — are familiar faces at Rush. All worked at Rush previously and are excited to be back as part of the new breast imaging team. The team will also include Rush newcomer Carol Corbridge, MD, as well as two radiologists already at Rush, Laurens Ackerman, MD, and Janice Dieschbourg, MD.

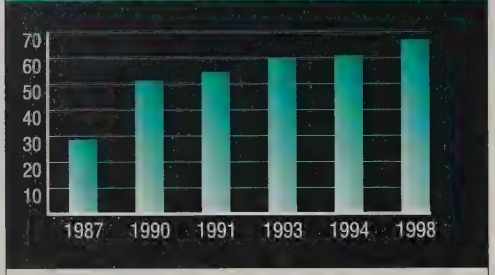
"We have been able to assemble one of the finest teams of physicians, technologists and support staff dedicated to providing women with highly specialized breast imaging services and consultation in a comfortable new setting," Jokich says.

In addition to screening and diagnostic mammography, other specialized breast imaging procedures are performed in the center, including breast ultrasound, stereotactic and ultrasound-guided core biopsies, fine needle aspirations, ductograms and preoperative needle localizations.

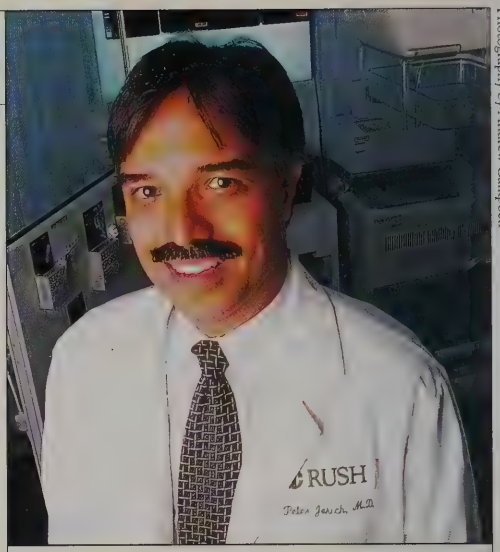
The center uses improved workflow to minimize patient waiting times and free the available staff to focus on imaging services rather than clerical processes. The center also features all new state-of-the art breast-imaging equipment, including one imaging unit that combines both film and digital capabilities.

With the new facility and additional staff, Jokich estimates that at least 25,000 breast imaging examinations will be performed at Rush each year. And as time goes on, the lag time between making an appointment and getting into the office should be drastically reduced. *— by Jill Waite*

Use of Mammography in Women 40 Years of Age and Older (in percents)



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey.



Photography by Andrew Campbell

Rush recently welcomed back several former radiologists, including Peter Jokich, MD, director of the new Rush Breast Imaging Center.

Rush Children's Hospital unveils new pediatric outpatient unit

Photography by Steve Gadomski

Pith-helmeted patient Colby Ullum, 8, and Kristen Winkler, RN, doing her best parrot imitation, were on hand for the official vine cutting on May 9.

Rush is more kid friendly than ever, now that its new pediatric outpatient specialty unit is up and running. On May 9, Rush staff, trustees and guests gathered to celebrate the grand opening of the new unit, which brings together for the first time three of Rush Children's Hospital's highest-profile pediatric outpatient programs: the Rush Children's Heart Center; Pediatric Respiratory Medicine, including the pediatric sleep physiology laboratory and the pediatric pulmonary function laboratory; and the Pediatric Dialysis Unit.

With its colorful rainforest theme, the unit provides a warm, welcoming and comfortable environment for Rush's younger patients and their families. It also enables the sharing of waiting areas and conference rooms and facilitates easy interaction among the clinical staff from all three programs.

"Coming to the hospital can be a terrifying experience, especially for kids," says Kenneth M. Boyer, MD, acting chairman of pediatrics. "With the recent changes, we hope to make hospital visits a little less intimidating for everyone."

— by Sean Carr

Recent appointments at Rush

Avery Hart, MD, has been appointed as director of internal medicine's division of general internal medicine. He is also chief of general internal medicine and primary care at Cook County Hospital, where he has been director of faculty development in internal medicine since 1994 and director of their general internal medicine fellowship program since 1996. In 2000, he received the Quentin Young Award for Faculty Leadership.

Susan K. Jacob, PhD, has been appointed associate dean for medical student programs. Jacob, who has been honored four times as the outstanding basic science teacher by the students of Rush Medical College, has been acting associate dean since 2000.

Peter Jokich, MD, has returned to Rush as director of the new Breast Imaging Center (see story on p. 26). Jokich completed his residency in diagnostic radiology at the University of Chicago, and in 1985 he joined the U of C faculty as assistant professor of radiology. He came to Rush in 1989 as associate professor of radiology and director of diagnostic radiology and nuclear medicine's section of breast imaging, returning to U of C a decade later. There, he was associate professor of clinical radiology, director of the section of breast imaging and, for the last year, an associate investigator at the Cancer Research Center.

Dino Rumoro, DO, has been appointed clinical chairman of emergency medical services. Rumoro received his osteopathic medicine degree from Midwestern University's Chicago College of Osteopathic Medicine and completed his emergency medicine residency at Cook County Hospital, where he was chief resident from 1993 to 1994. He has served as assistant clinical professor of emergency medicine on the affiliate faculty of the University of Illinois and on the emergency staffs at Central DuPage Hospital, Edward Hospital and Our Lady of the Resurrection Medical Center.

Robert Simon, MD, professor and chairman of emergency medicine at Rush Medical College, has been named chairman of Rush's new Department of Emergency Medicine. He has been chairman of emergency medicine at Cook County Hospital since 1988 and previously held prominent positions at Marquette General Hospital and at UCLA, in the School of Medicine and in the hospitals and clinics. Simon received his medical degree from Wayne State University in 1970 and, after a surgical internship at Detroit General Hospital, finished his residency training in emergency medicine at the University of Chicago Hospitals.

Edward Stepanski, PhD, was named director of the Rush Sleep Disorder Service and Research Center. Stepanski, who came to Rush in 1998 as director of the Rush Sleep Laboratory, is an associate professor in the departments of psychology and medicine. He previously was director of the insomnia clinic at the Henry Ford Hospital Sleep Disorders and Research Center, and clinical director at the University of Illinois Hospital's Center for Sleep and Ventilatory Disorders.

Rush elects new trustees

Christine Edwards and **Perry Pero** have been elected general trustees, and **Gunnar Andersson, MD, PhD,** has been elected an annual trustee at Rush-Presbyterian-St. Luke's Medical Center.

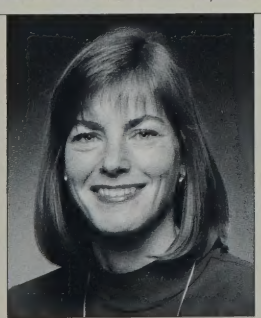
Edwards is the executive vice president, chief legal officer and secretary of Bank One Corporation, and she previously was chief legal officer of ABN Amro North America and Morgan Stanley Dean Witter. She became the first female general counsel on Wall Street and has successfully increased the diversity of her companies' boards of directors by recruiting female and minority candidates.

Pero is vice chairman and chief financial officer of Northern Trust Corporation and its principal subsidiary, the Northern Trust Company. He is also responsible for risk management and is chairman of the corporate asset and liability committee for the company, which he joined in 1964. He serves as the director of the Local Initiatives Support Corporation, a trustee of the Glenwood School for Boys and on the business school advisory council of his alma mater, Clark University.

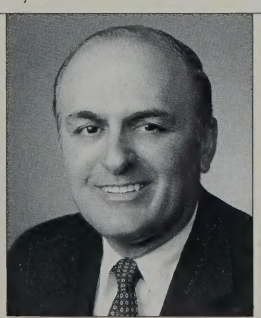
Andersson, who was recently elected president of the medical staff, is the William A. Hark, MD – Susanne G. Swift Professor and Chairman of Orthopedic Surgery at Rush. He is the past president of the International Society for the Study of Lumbar Spine and the International Society of the Electrophysiologic Kinesiology and last year served as president of the Orthopedic Research Society.

Gorelick named to presidential chair

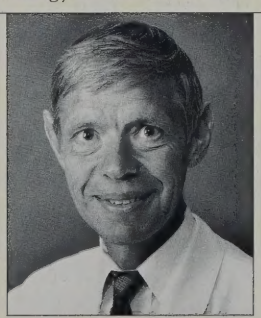
Philip B. Gorelick, MD, MPH, has been appointed to the Deborah R. and Edgar D. Jannotta Presidential Chair, one of 85 endowed chairs at Rush. Gorelick is founder of the Rush Center for Stroke Research and director of the section of cerebrovascular disease and neurological critical care in the department of neurological sciences at Rush. He is also a member of the American Medical Association and the American Heart Association and is past president of the section of stroke and vascular neurology for the American Academy of Neurology.



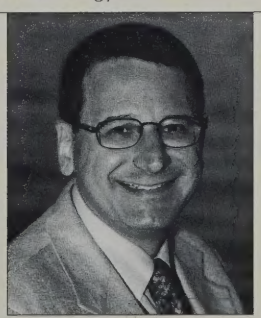
Christine Edwards



Perry Pero



Gunnar Andersson, MD, PhD



Philip B. Gorelick, MD, MPH

Leo M. Henikoff, MD, announces his retirement

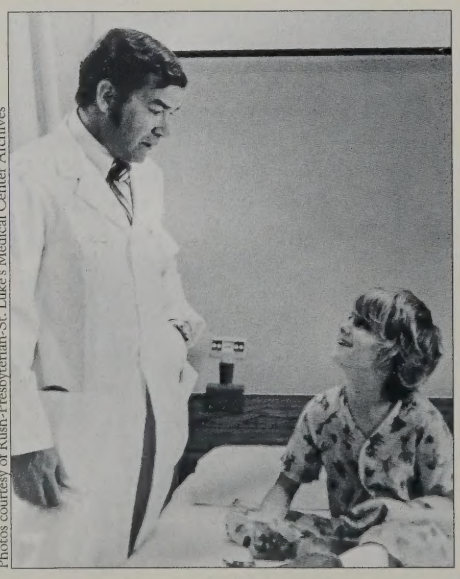
On May 4 Leo M. Henikoff, MD, announced his retirement. Henikoff will step down from Rush's highest post once the search for his successor is concluded.

Henikoff's career at Rush spans almost 40 years. He arrived at Presbyterian-St. Luke's Hospital as an intern in 1963, staying on for his residency and then a fellowship in the section of pediatric cardiology. In 1971, he joined the faculty of Rush Medical College.

Over the next decade he held several other positions at Rush, including associate dean of student affairs, acting dean of the medical college and vice president for interinstitutional affairs at the Medical Center. He left in 1979 and served five years as dean of the school of medicine and vice president of the university for medical affairs at Temple University in Philadelphia before returning to Rush as president and CEO in 1984. In the 17 years since, Rush has grown both in size and reputation.

"I have been extremely fortunate to be a part of Rush during one of the most exciting periods in the history of medicine," Henikoff says. "We have seen technology and medical research come together in unimaginable ways to cure disease and improve the way we live."

— by Judy Grossman



Photos courtesy of Rush-Presbyterian-St. Luke's Medical Center Archives

Leo M. Henikoff, MD, shown with a young patient (lower left). Above (left) he appears with now secretary of state Colin Powell, Marshall Field and Edgar D. Jannotta (l-r) and those who helped make the Robert H. and Terri Cohn Research Building a reality (above right): Edward A. Brennan (l) and Terri Cohn (r).

The *RushRecord* recently asked friends and colleagues to share their thoughts of Dr. Henikoff, and what he has meant to Rush.

"I come back to Rush for reunion every year for two reasons: to reconnect with the school and to see Leo Henikoff again. He interviewed our class for admissions, and he is a big part of why we all find Rush such a friendly and welcoming place."

— Joseph Bernardini, MD '75
President
Rush Medical College Alumni Association

"Leo Henikoff's contributions to this Medical Center and Rush Medical College will never be forgotten. And on a personal level, he is largely responsible for my career at Rush and the success that I have enjoyed."

— Steven Gitelis, MD '75
Professor and Associate Chairman
Department of Orthopedic Surgery at Rush

"Leo Henikoff became Rush CEO about the same time I joined the Woman's Board. He has always been a dear friend and staunch supporter of the Woman's Board. On behalf of the board, I would like to thank him for his constant help and encouragement."

— Sue Austin
President
Rush Woman's Board

"Leo's contributions to Rush are immeasurable. Under his leadership we have expanded research facilities, grown Rush University and, as always, have had an uncompromising emphasis on providing quality patient care."

— Edward A. Brennan
Chairman
Rush Medical Center Board of Trustees

"The Professional Nursing Staff organization and the shared governance model of nursing at Rush would not be as advanced without the support of Dr. Henikoff. He has always shown a great deal of respect and admiration for nurses."

— Liz Krch-Cole, RN
President
Professional Nursing Staff

Pediatric Picassos Sweeten City Scene

Photography by Paul Szewais

"Sofa(r) From Home" is the work of more than 200 Rush pediatric patients, who, with the help and guidance of the Snow City Arts Foundation and the Rush Woman's Board, were able to play their own part in the city's latest public art exhibit, "Suite Home Chicago." And the kids really put themselves into their art: in addition to decorating the "hospital" green couch with colorful painted tiles, they also filled its 31 cubbyholes, representing the 31 rooms on the Rush pediatrics unit, with individual pieces ranging from small sculptures and other objects to their own poems. The couch and all its contents were on display from June through October at the James R. Thompson Center in downtown Chicago.

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